

NOT TO BE TAILED AWAY.

[ADMINISTRATION REPORT]

Annual Report

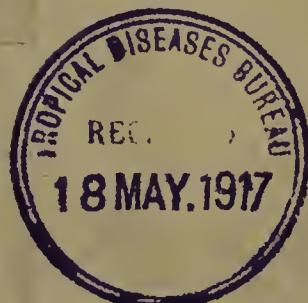
OF THE

CORPORATION OF MADRAS

HEALTH DEPARTMENT

FOR

1913



MADRAS
THE GUARDIAN PRESS
SECOND LINE BEACH

1914



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WELLCOME INSTITUTE

Coll.	1913
Q.M.	+
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	WA 28
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1913

MAP OF MADRAS

Scale 1 Inch = 1 Mile

Furlongs 8 6 4 2 0

2 Miles



REFERENCE

— Madras District Boundary

19 Municipal Division Boundary & Number

→→→ Railway Line & Station



FORM NO. A.—METEOROLOGICAL DATA.

LATITUDE $13^{\circ} 4''$ N.LONGITUDE $80^{\circ} 15'$ E.

MONTHS.	Barometer. Mean daily reading. Inches.	Reading of Thermometer.				Rainfall.			
		Dry.		Dew point.		Number of days on which rain fell.	Total fall during the rain month.	Maximum fall of rain during 24 hours.	Inches.
		Maximum range.	Mean daily value.	Mean daily range.	Mean daily value.				
January	1913.	... 30.016	... 84.2	... 67.8	... 16.4	... 75.5	... 65.0	... 132.4	... 10.5
February	"	29.956	87.0	71.2	15.8	78.8	70.3	134.1	8.6
March	"	86.9	92.0	73.1	18.9	81.9	70.5	137.9	11.4
April	"	80.0	94.2	78.9	15.3	85.4	75.1	137.8	10.3
May	"	72.7	98.3	80.5	17.8	87.2	74.2	138.6	13.0
June	"	67.4	100.1	82.7	17.4	88.6	71.6	132.9	7.0
July	"	71.0	95.9	79.1	16.8	85.6	71.9	130.7	13.7
August	"	73.7	97.6	79.9	17.7	86.5	70.3	135.7	16.2
September	"	78.1	95.0	78.2	16.8	84.6	74.1	139.6	10.5
October	"	86.5	68.5	74.6	13.9	89.6	73.2	129.1	7.4
November	"	94.8	84.0	73.4	10.6	78.1	71.2	122.2	6.9
December	"	30.005	83.1	71.1	12.0	76.4	69.9	123.2	6.5

CORPORATION OF MADRAS,

HEALTH DEPARTMENT,

Madras, 22nd May 1914.

FROM

CAPTAIN A. J. H. RUSSELL, M.A., M.D., D.T.M., I.M.S.,

Ag. HEALTH OFFICER.

Corporation of Madras, Madras.

TO

THE PRESIDENT,

CORPORATION OF MADRAS.

SIR,

I have the honour to submit, herewith, the Health Officer's Report for 1913.

Formerly a statement dealing with the public health of the city was incorporated in the President's Annual Administration Report, but the Government decided in G. O. No. 210-M., dated 5th February 1913, that something more might with advantage be supplied, and that the Health Officer should prepare an annual review for the calendar year "on descriptive and critical lines of the facts, figures and results recorded in the Administration Report, the conclusions to be drawn and the measures which should be adopted with reference thereto."

The report now submitted follows these recommendations, as far as possible, and is divided into the following sections :—

1. Sanitation.
2. Conservancy.
3. Vaccination.
4. Plague.
5. Vital Statistics.

Attached, in the form of appendices, are three memoranda already submitted to the Corporation, dealing with the important subjects of "Milk Supply," "Notification of Tuberculosis" and "Municipal Midwives." Only brief reference, therefore, has been made to these subjects in the body of the report.

My best thanks are due to Dr. Singaravelu Mudaliar, the First Assistant Health Officer, for valuable assistance rendered in the preparation of the report.

I have the honour to be,

Sir,

Your most obedient servant,

A. J. H. RUSSELL, M.A., M.D., D.T.M.,

CAPT. I. M. S.,

Ag. Health Officer.

CORPORATION OF MADRAS.

Health Department.

Annual Report for 1913.

SANITATION.

Officers of the Health Department.—Dr. W. R. Macdonald, the Health Officer, on 19th December 1913, proceeded to England on seven months sick leave and Captain Russell, I. M. S., was appointed to act for him. For administrative purposes, the city is divided into North and South Ranges, the former comprising the first nine and the latter, the remaining eleven divisions. The general sanitary and conservancy measures are under the immediate charge of two Assistant Health Officers, one for each range. For several years there have been only two Assistant Health Officers but a third was sanctioned in G. O. No. 924 M., dated 7th May 1913 and he took up his duties on 1st August. From 1st August, the administration of the Vaccination, Vital Statistics, Burial and Burning Grounds, and Plague sections for the whole city was transferred to the new assistant, general sanitation and conservancy remaining vested as hitherto in the two Range Officers. Several changes among the assistants occurred during the year. Dr. K. T. Matthew, Senior Assistant Health Officer in charge of the North Range was appointed on probation as a Deputy Sanitary Commissioner to Government, and was relieved on 12th December, by Dr. C. Singaravelu Mudaliar, the 2nd Asst. Health Officer. Dr. G. Raman Pillai was appointed Second Assistant and continued to be in charge of Vaccination, Vital Statistics, Burial and Burning Grounds, and Plague Operations. Dr. S. Isaac was appointed on probation as 3rd Asst. Health Officer and was placed in charge of the South Range.

The year under report witnessed a reorganization of the Department in almost all its branches. The staff of Sanitary Inspectors was increased from 15 to 20, giving one for each division of the city. The number of Sanitary Maistries was also increased from 15 to 20, their designation being changed to Process Servers and their scale of pay revised. The office staff was also increased. A Second Food Inspector was appointed on 1st August and the two Inspectors now work under the direct supervision of the two Range Asst. Health Officers.

The nature of work in charge of the sanitary section of the Health Department is briefly described in paragraph 198 of the Corporation Code Vol. I and consists mainly of—

- (1) The inspection of private buildings and premises with a view to enforce the sanitary provisions of the Act in regard to general healthiness, ventilation, drainage and latrine arrangements, suitability for human habitation and abatement of over-crowding;
- (2) The inspection of abandoned places and unwholesome and insanitary lands, tanks, wells, pits, low-lying lands, etc., and enforcing their sanitary condition and up-keep.
- (3) Inspection of premises, in connection with building applications, and while under construction.
- (4) Inspection of places where dangerous and offensive trades are carried on, and of such places as cattle yards, oil mills, hack stables, bake-houses, aerated water factories, markets, lodging houses, etc., with a view to see that the terms under which these places are licensed are fulfilled, and that the provisions of the Act and the bye-laws are duly carried out.

(5) The inspection of articles of food and drink offered for sale, and prevention of the sale of unwholesome articles.

(6) Control over slaughter-houses, public markets, dhoby-khanas, lethal chambers, etc.

(7) Prevention of infectious and contagious diseases of men and animals and taking steps to check their spread, and,

(8) Formulation and promulgation of measures for the improvement of general sanitation and public health of the city not specifically covered by any of the above.

The several items mentioned in the foregoing paragraphs will be dealt with as arranged in the Municipal Act, to facilitate reference.

Drainage, Latrines and Urinals. (Sections 208-221).—The provisions of Sections 208—221 relating to drainage were for the most part carried out by the Works Department in conjunction with the Health Department. The extent to which they were worked during the year will be seen from the following statement of notices and prosecutions.

Under Section 218, two notices were pending disposal at the commencement of the year and 62 were served. Of these, 24 notices were voluntarily complied with by the parties, 8 transferred to the Works Department for execution and recovery of costs, and the remaining 32 await disposal.

Old and objectionable ditch drains were replaced by masonry drains in eighteen cases. The large majority of these was carried out in the 11th and 12th Divisions, but much remains to be done in this direction. 32 of the old masonry public drains which are to be found throughout the city were thoroughly repaired. No connections between house and public drains were made without the previous approval of the President. Instructions regarding new connections were embodied by the Health Department in notices served upon the parties concerned, and, on non-compliance with the terms of the notice, the Works Department carried out the necessary work. Delay, however much to be deplored on sanitary grounds, is inevitable in these cases.

The Health Department and the Special Works (Drainage) Department are in constant communication regarding these house connections, and the work is being done in accordance with the prescribed bye-laws and rules. Steps were also taken for the effective disposal of storm water by the provisions and maintenance of troughs and pipes. Certain defects which have been experienced in the working of this Chapter of the Act have been noted for amendment.

Public Latrines and Urinals. (Sections 222 & 223).—Seven new public latrines were built during the year by the Corporation. Several combined latrines and urinals of the new flush-out type were provided at sites where they seemed necessary and these worked satisfactorily. Some of the old pattern in use were not satisfactory, and their conversion into the flush-out type, wherever there were the necessary sewer connections and an adequate water supply, was decided on. Many of the public latrines are admittedly a nuisance to the neighbourhood, but this is largely due to their misuse by the people. At the same time more stringent measures have been adopted for the proper conservancy and regular disinfection of these places.

The hand-removal of large quantities of excreta from latrines to Municipal carts is undoubtedly an unmitigated nuisance, but where every street side-drain is openly used as a latrine, the people have little cause for complaint regarding the nuisance caused by public latrines.

The Corporation is, unfortunately, unable to provide as many latrines as are urgently required, and it is regrettable that owners of hutting grounds &c., make little or no attempt to assist the Corporation in providing their tenants with suitable latrines and urinals, although section 223 of the Act specially provides for the licensing of these.

Private latrines and Urinals. (Sections 224-227).—During the year, the provision of latrines by persons employing workmen or labourers, by owners or occupiers of dwelling houses, of markets and of cart stands, was insisted upon. 80 notices under Sections 224, 225 and 226, remained pending at the beginning of 1913 and 437 were served during the year ; 303 were complied with, 198 of them being only after prosecution; 40 were transferred to the Works Department for execution of work and recovery of costs, after conviction of the parties, and 29 were either cancelled or withdrawn. The remaining 145 were pending at the end of the year.

Under Section 227, 42 notices were carried over from 1912, 111 were issued during the year. Of these, 134 were voluntarily complied with, 5 were transferred to the Works Department, while the remaining 14 stood over. The efficient disposal of drains at the backs of private houses received particular attention throughout the year.

Draining of private Streets (Sec. 245).—4 Notices for the effective draining of private streets were served on owners. One was cancelled and 3 were transferred to the Works Department after conviction of the parties concerned. Much remains to be done in this direction.

Projections and obstructions over drains in streets (Sections 247 and 248).—With the co-operation of the Engineering Department vigorous steps were adopted to prevent the highly objectionable projections and covers placed over street drains by bazaar-men. These render the cleaning of the drains difficult and subject to sewer emanations the articles of food exposed there for sale. Notices were served, but it was only after prosecution that some of these encroachments were removed by the parties. The Works Department on the advice of the Health Department tried to meet the requirements of the trading public by covering with cement slabs (leaving ventilating interspaces) such drains as could be covered without injurious effects from enclosed sewer air. Of the several places dealt with in this way Pycroft's Road may be cited as a striking instance. Several streets in the vicinity of Pycroft's Road require early attention in this respect, the inhabitants having legitimate cause for complaint regarding the stench emanating from the deep drains running by their houses but it is understood that this cannot be carried out, until sewers are laid down.

Building Regulations (sections 260 to 265).—Plans accompanying applications for erection, re-erection and repairs to buildings received in the Works Department are referred to this department for scrutiny and remarks as to ventilation, sanitary arrangements, etc., and in this way strict enforcement of the sanitary regulations in regard to buildings is obtained. This is a most important part of the work of the Sanitary Inspectors, the rules and orders on the subject requiring that all buildings should before completion be inspected, with a view to verification of the sanctioned plans. 1960 applications were referred to, and dealt with, by the sanitary staff during the year.

The Health Department is said to frequently subject the public to undue hardship by insisting on the rules laid down in Schedule XII, Part III of the Act, regarding the provision of one third open space in domestic buildings. It has been found impossible in more than a few cases, to strictly enforce the rule but in the absence of a more elastic regulation, it is desirable that adequate through ventilation should be insisted on under the existing rule. The rule in question applies only to new buildings and to old buildings under reconstruction, but the Health Department rightly disallows any proposal to make further encroachments on open spaces already less than the regulation one third.

Prohibition against accumulation of filth and allowing sewage to flow in streets (Section 300).—Under Section 300, Sub-Sections (5) and (6), 2 notices were carried over, from 1912 and 212 were served during the year. Of these, 77 were voluntarily complied with, and 31 only after prosecution. 1 was transferred to the Works Department and 2 were either cancelled or withdrawn. 103 thus remained undisposed of at the end of the year. A very large number of these pending notices is for prohibiting sewage from flowing in streets and

part of the delay must be attributed to the situation regarding the provision of underground sewers with house connections throughout the city.

Unwholesome sources of watersupply and stagnant water (Sections 301-304). This matter was the subject of special attention during the year owing to the prevalence of, Malaria. 3,116 notices were served during the year in addition to 98 carried over from 1912. Of these, 1595 were complied with and 627 only after prosecution. 38 were forwarded to the Works Department for execution of work and recovery of costs, 618 cancelled or withdrawn and 336 remained undisposed of at the end of the year. Since the inauguration of the special malaria staff, a definite and systematic policy has been adopted in treating wells and tanks of an injurious nature. Insanitary tanks and wells, etc., were filled up while others were permitted to remain on condition that sanitary requirements were carried out in strict compliance with the Health Officer's orders. Domestic wells in use were required to be cleaned of silt, disinfected and furnished with mosquito-proof wire gauze. As this gauze proved unsatisfactory, later notices required wells to be covered over with tight fitting cemented covers and provided with hand-pumps. Where tanks had to be retained for irrigation purposes, a revised notice was issued and the owners were requested to deal with the tanks as follows :—

- (1) All over-hanging trees, bushes and vegetation to be removed so that the surface of the water might remain open to the sun.
- (2) The banks to be sloped as steeply as possible, so that no depressions or shallow edges might remain.
- (3) All water weeds, grass, leaves, etc., to be removed periodically, and the tank to be stocked with larvical fish.

Leaflets containing instructions for keeping tanks and wells in a clean and sanitary condition were printed and widely distributed. The energies of the Health Department have been particularly concentrated during the year in this connection. This subject will, however, be more fully dealt with by the Special Malaria Officer of the Corporation.

Abandoned places (Section 305).—Inspection of these places and the taking of steps to put them in a proper condition is a routine duty of the sanitary staff. Excluding 13 pending cases, 55 notices under this section were served during the year. Of these 50 were complied with either voluntarily or after prosecution.

Unwholesome lands. (Section 306).—362 notices under Section 306 for the removal of filth, prickly pear or other noxious vegetation were served during the year, besides 2 left over in the previous year. The terms of 349 of these were complied with.

Lime washing and cleansing of buildings (Section 307).—As the result of action taken under Section 307, 794 houses were white-washed and cleansed during the year.

Insanitary buildings (Section 308) and buildings unfit for human habitation (Section 309).—2,191 houses were inspected in the course of the year with a view to remedying sanitary defects. 1830 houses were improved, while 57 notices were transferred to Works Department for the work to be done at owner's cost.

The work of house to house inspection is very important. The mere inspections in themselves do not occupy much time, but when notices have to be served, prosecutions carried through, and each case watched in its entirety, some allowance may be made for the small number of house inspections done. In certain divisions, too, antimalarial work considerably interfered with these inspections. Other Sanitary Inspectors, however, had not this additional work, and this part of their duty seems to have been considerably neglected. An improvement may be looked for during the next year. Chronic cases of insanitation previously dealt with under Section 308 may in certain instances fall under Section 309. Of the 114 houses condemned as unfit for human habitation under this Section, 83 were vacated.

Overcrowded buildings (Section 310).—Only one case of overcrowding was successfully dealt with during the year, and it has been found practically impossible to take action under this section under existing conditions. In certain parts of the city there is great congestion and almost every house is already so overcrowded that any attempt to enforce Section 310, would only lead to more objectionable overcrowding in another building. The efforts of the Health Department are therefore not likely to lead to any improvement, until such time as the Corporation is able to make a decided advance in its work of relief of congestion. A definite scheme of extension of model-houses to suit the needs of the growing population of the city is very essential, and until this is an accomplished fact, the overcrowding cannot be really checked.

Fishing (Section 311).—79 prosecutions for fishing in the Cooum were instituted during the year. The insanitary condition of this river is well-known, and it was considered necessary to restrict its use as much as possible. Fishing, therefore, was prohibited, as was the watering of milch cattle. Warning Notice Boards were erected at intervals on its banks and vigorous prosecutions were instituted. This measure is, however, merely tinkering with the nuisance and complaints are rife regarding the stench, especially during the hot weather. The Public Works Department who are in charge of its conservancy have been instructed by Government to cut open the bar at the mouth of the Cooum, as often as possible, with a view to convert it, at least in part, into a tidal river. This is, however, only a makeshift, and it is to be hoped that, in time, some satisfactory method of dealing with this meandering cesspool will be discovered.

Destruction of stray swine, Dogs' Homes and Lethal Chambers (Section 313).—Any swine found straying within Municipal limits are destroyed under Section 313. Unmuzzled dogs found straying in the city are also destroyed at the expense of the Corporation, which makes the necessary allotment and places it at the disposal of the Commissioner of Police. This is a desirable sanitary measure, not only with reference to hydrophobia, but because many of these dogs suffer from loathsome skin diseases. An amendment to Section 313 in order to include stray dogs has been suggested for consideration.

A brief description of the arrangements now in force for the destruction of these dogs may be of interest. Formerly the S. P. C. A. arranged for the destruction of the dogs but after a time the society suggested that the Corporation might maintain a Dogs' Home and a Lethal Chamber where the animals could be destroyed in a humane manner. This suggestion was adopted and buildings were erected in the vicinity of the two large Incinerators at Krishnampet and Basin Bridge.

The dog catchers, on handing over the dogs to the Superintendent of the Incinerator, obtain receipts, and on production of these, the Commissioner of Police disburses rewards at the rate of 4 annas *per* dog or bitch and 1 anna *per* pup. All dogs,—except those rabid and obviously unhealthy which are immediately destroyed,—are kept for three days. If they are not claimed within that period, they are destroyed. 3,003 dogs, 2,957 bitches and 392 pups were destroyed during the year.

An improvement on the former practice of using carbon dioxide gas for the Lethal Chamber was made by substituting Hydrocarbon. This latter method effected a considerable saving in expenditure and in the time taken for destruction.

The right of feeding dogs while in Dogs' Home is annually let out on contract, and arrangements exist with Messrs. Chambers and Co., for the sale of skins of healthy dogs and pups at the rate of 1 anna 9 pies *per* skin. During the year the total expenditure was Rs. 3, 729-13-4 whilst the total amount realised by sale of skins and return of rewards for dogs claimed was Rs. 662-6-0.

Cattle yards, cow-sheds &c. (Section 314 and 315).—There are 636 cattle-yards (cow-houses) in the city. 7 were refused licenses and 201 were granted unconditional licenses. 13

applications for licenses remained pending disposal on the 31st December 1913, while the remaining 415 were granted licenses subject to the carrying out of sanitary improvements within a time limit. More stringent measures than heretofore were taken during the year to prevent stabling of milch cattle in dwelling houses, and as a result some cattle yards were refused licenses, while others were granted conditional licenses by which the cattle keepers were required to partition off the cattle-yard from the dwelling house where-ever such separation was found practicable. The increase in the grant of conditional licenses is to be attributed to the desire to gradually improve the sanitary condition of these yards without seriously interfering with the trade. 1076 prosecutions were launched, and 212 convictions under Sections 314 and 316 obtained, during the year to enforce the terms of licenses, without any appreciable improvement in the condition of the yards. In a few selected instances in which well-to-do parties heedlessly delayed compliance with requirements, the Engineering Department executed the works and the Revenue Department was called upon to recover the cost.

The whole question is being considered in connection with suggestions for improvement of the milk supply.

Stables and Cart-stands (Section 315).—Similar insanitary conditions are found in stables and cart-stands as in cattle yards. Special attention was paid to them and daily removal of manure from these places was enforced.

Public Bathing and washing (Sections 318 and 319).—Under Section 318, the Corporation has provided three places for public bathing and washing for Brahmins and caste Hindus in the 4th, 17th and the 18th divisions, and one for pariahs in Vasamode, 6th division. The poorer classes of the community including those dwelling in paracherries and hutting grounds are subjected to severe hardship for want of suitable bathing and washing places. These people very commonly wash clothes and bathe at public taps, a sight unquestionably offensive to passers-by and those living in the neighbourhood. The question of providing additional bathing and washing places is worth consideration. The nuisance caused by animals being washed on the road side and in other objectionable places, contrary to Section 319 also requires attention.

Dangerous or offensive trades. (Sections 320-324).—Sections 320 to 324 of the Municipal Act received due attention with regard to Sanitation. The following paragraphs will show the large number of cases dealt with. Wash houses, skin godowns, indigo-dyeing factories and bone stores were more frequently inspected by the sanitary staff, and conditions were generally improved.

Brick and Lime kilns.—There are 46 brick kilns in the city in addition to the Government Brick kiln in Poonamallee High Road. These are scattered in the outlying divisions viz : the 3rd, 10th, 11th, 14th, 19th and 20th. Lime kilns numbering 33 are similarly situated. Both classes of kilns, though distant from residential quarters, are close to public roads. Volumes of smoke emanate from brick kilns at all hours of the day and the fumes from the slaking of lime, and the dust thrown out during the process of sifting, considerably inconvenience passers by. These brick kilns were originally built where clay was available, and the excavations thus produced have resulted in the formation of large pits &c. in which water stagnates. These are a distinct source of danger, and no doubt are partly responsible for the serious outbreaks of Malaria in Purasawakam. In the interests of public welfare, these kilns should be removed out-side municipal limits. The Government in taking the lead in this matter by ordering the removal of the brick-kiln on the Poonamallee High Road has in no small measure aided the Corporation in its endeavour to get rid of this nuisance. A move was therefore made during the year by serving notices on owners of kilns warning them that licenses would not be renewed after 31st March 1914.

Oil Mills.—196 applications were received during the year for the licensing of oil mills. 163 were granted unconditional, while 32 were given conditional licenses. The remaining application was not disposed of at the close of the year. These mills are grouped

together in large numbers in the midst of populous parts of the city. Their sanitary condition is quite as bad as that of the cow-houses already mentioned, while the incessant and unbearable noise produced by them is an additional and legitimate cause for complaint from the surrounding population. The animals used for driving the mills frequently suffer from infectious or contagious diseases and the mills are thus centres for their active propagation. Attempts to improve existing conditions having proved futile, the owners were directed during the year to remove their mills. This demand they were unable to comply with, and proposals have been made for their wholesale removal to less inconvenient and more sanitary localities. With the sanction of the Standing Committee the initial step was taken for the acquisition of land in the south range for the mills in Triplicane.

Paddy boiling houses. 445 applications were received for the licensing of paddy boiling houses. Of these 2 were refused, 401 were granted unconditional, 32 conditional, licenses, and the remaining 10 are still pending disposal. Strict attention was paid to these houses in regard to cleanliness, and the provision of suitable receptacles for soaking paddy, and of impervious platforms for drying purposes was insisted upon. In the absence of an adequate and pure water supply, water from shallow surface wells is brought into use and frequently this water is used again and again, until the stench is so foul that it vitiates the whole surrounding atmosphere. To augment this nuisance, in the Tinnevelly Settlement of the 2nd Division, where there are as many as 352 paddy boiling houses, there is no proper drainage system and the result is that all the waste water surcharged with organic matter soaks through the already polluted soil and finds its way into the sub-soil water. It is not surprising, therefore, that the mortality in this division is very high ; in fact, the Tinnevelly Settlement is notorious for its high death rate from intestinal diseases. When the new water works and the drainage scheme are completed in Tondiarpet, it is hoped that most of these sanitary short comings will cease and in the meantime all possible steps are taken to limit the number of licenses or to grant them only under conditions as little injurious to public health as possible.

Aerated water Factories. (section 328). There are 23 licensed Aerated Water Factories in the city. 13 were granted unconditional licenses while the remaining, 10 were granted conditional licenses which demanded sanitary improvements within a prescribed period. Frequent and vigilant inspections by the sanitary staff are necessary, for although the factories are equipped with the necessary filtering and boiling plant, the employees in some of them are incapable of using the plant intelligently. The capacity of the sand filters and the cleanliness of candles employed in Berkefeld filters do not receive due consideration in many cases, and the so-called filtered water is frequently boiled as a last step before it is aerated. The sale of impure waters cannot be completely stopped until an analytical Laboratory, where analyses and bacteriological examinations can be systematically carried out, is established. The system of having registers in these premises for record of all inspections and recommendations made has been of considerable benefit.

Bake-houses. (Section 328).—264 applications were received during the year for the licensing of bake-houses. 80 were granted unconditionally ; while 151 were granted licenses subject to the fulfilment of sanitary improvements. The remaining 33 were pending disposal on 31st December. These were inspected regularly and systematically by the sanitary staff and the production of medical certificates for all employees was demanded, with the result that marked improvement was effected. Much still remains to be done, however. Accommodation in many cases is quite inadequate and several licenses were withheld for this reason, as a reference to the pending list will show. The use of bake-houses day and night without systematic daily cleaning is a condition difficult to cope with. The system of hiring out of the licensed premises to unlicensed parties is responsible for this state of affairs, and until a clause prohibiting this is included in the license little can be done to improve matters. The unclean habits of ignorant workmen are aggravated by a total disregard of the condition in the license binding the proprietor to see that his employees

wear aprons while at work. Rigorous prosecution is the only possible recourse left to effect an improvement, and orders have been issued to this effect.

Sweet-meat Bazaars (Section 328).—Much has been done to improve the sanitary condition of sweet-meat bazaars. Apart from the difficulty experienced in the absence of a Corporation laboratory in the detection of adulterated oils and ghee which are freely used in the preparation of sweets and of the mixture of stale and fresh sweets, several other difficulties to be contended with, deserve attention. In these bazaars, as a rule, both manufacture and sale of sweets are carried on. Adequate accommodation being essential, and space being limited, these bazaarmen extend the stalls over the street drains, an admittedly objectionable procedure, and even then space is so cramped that the inspecting officer usually finds it difficult to gain an entrance. In spite of periodical limewashings the bazaars present a dirty appearance owing to the large volumes of smoke and soot issuing from the ovens, whilst all boiling pans and vessels are cleansed on the street immediately over the open side drains. Steps were taken to have the articles exposed in such bazaars protected from flies, dust etc., by the provision of glass shutters. But on the plea that they impede trade, they are seldom brought into use except when an inspecting officer appears. In spite of 433 prosecutions and convictions, the same conditions prevail and until provision of sufficient accommodation is insisted upon, little more can be done to remedy matters.

Coffee Hotels.—Coffee hotels are in a comparatively better condition than sweetmeat bazaars so far as cleanliness and accommodation are concerned, but the preparations exposed for sale in them are not free from the same defects. Coffee is freely mixed with chicory, and watery and adulterated milk is used. Under existing circumstances, improvement of the sanitary conditions of these hotels is all that can be attempted, and sanitary certificates are granted to parties who comply with the conditions laid down.

Lodging Houses.—Lodging Houses include hotels and emmigration depots. The bye-laws regulating the conduct of these houses were strictly enforced. By the issue and renewal of sanitary certificates the condition of these houses has been considerably improved and efficiently maintained. 170 prosecutions were launched during the year for failure to take out sanitary certificates. To prevent overcrowding the sanitary certificate should mention the specific number of lodgers allowed in the lodging houses. This will require personal inspection of every lodging house by the Health Officer or, Asst. Health Officers and it is proposed to carry out these inspections during 1914.

Washing (Section 329).—Arrangements throughout the city for public washing are not satisfactory.

Under Section 329 (i) of the Municipal Act, the Corporation maintains a Dhobykhana at Chetput. The right of using it, prior to 1912, was leased out on contract annually by public auction, the highest amount realised being Rs. 360. This system failed to effect the object in view, as the contractor's only consideration was monetary gain. The Standing Committee, therefore, resolved in March 1912 to discontinue the system of leasing, and to give the dhobies living in the neighbourhood free use of the place. Action under Section 330 of the Act which prohibits washing by washermen at unauthorised places was taken during the year, and this coupled with the facilities afforded by the free use of the Dhobykhana, resulted in the dhobies of the 13th, 14th and 15th divisions resorting to the place. The Dhobykhana is now being improved and extended; and when completed, it is proposed to charge each dhoby a small monthly fee.

106 applications for licenses from dhobies under Section 322 of the Act were received during the year. 10 were rejected, 42 were granted unconditionally, 48 on conditions, and the remaining 6 were pending on 31st December. The provision of suitable washing places requires early attention, as the dhoby often serves as the medium for the transmission of infectious disease. The majority of the dhobies generally use either insanitary tanks and

stagnant pools within easy reach, or water from a filthy surface well, while a few go to Saidapet and the adjoining villages. The stones on which the clothes are pounded are, as a rule, placed on bare ground within a few feet of the source of water. In the absence of drains, the foul washings gradually finds its way into the sub-soil water. Washing under such insanitary conditions is without doubt injurious to public health. To make matters worse the dhobies store soiled and washed clothes in the same ill-ventilated and dirty rooms. The dhobies' houses were frequently inspected by the sanitary staff. Their general sanitary condition was improved and the storage of soiled and washed clothes in separate rooms was enforced, although storage of any kind in living rooms is highly objectionable. Attention was also paid to the hygienic condition of the localities in which washing took place. Notwithstanding the adoption of these measures, no noteworthy results can be possible until the Corporation or the capitalist provides an adequate number of sanitary dhoby-khanas at convenient sites. In any case one such wash house is urgently required for the North Range and this should engage the attention of the Corporation as soon as its financial position permits of the expenditure.

Licenses.—The licensing of cattle-yards, stables, oil mills, markets, dhoby-houses, etc., which formerly was carried out by the Health Department, is now vested in a separate license branch. This branch issues licenses on receipt of the prescribed fees but subject to conditions laid down by the Health Department. It may be observed from the various figures already given that in very many cases "conditional licenses" are issued. As a matter of fact, these conditions are rarely carried out within the year, with the result that insanitary conditions continue to exist from year to year without any attempt being made on the part of owners to comply with the Municipal regulations and laws. The system of granting "conditional licenses" is at best only a compromise, but Licensees seem to consider that their indifference to the sanitary laws laid down by the Health Department is condoned; and therefore, the compromise is prejudicial to public health. It is a system which indirectly encourages the owners to avoid carrying out essential improvements and if these licensable premises are ever to be brought into a sanitary condition, conditional licenses must be considerably reduced in number. Although a limitation of the numbers will reduce revenue at first this is a factor which the Health Department cannot consider and it should be a standing rule that no conditional license should be issued for a second year. If at the end of one year no steps have been taken to comply with the conditions then the license should be cancelled until such time as the necessary sanitary requirements are carried out. Only in this way, will the Health Department be enabled to effect improvements.

Slaughter Houses. (Sections 331-335).—There are no private slaughter houses in the city. The Corporation maintains a slaughter house for sheep, goats, and cattle at Gantz Road and a small pen for the slaughtering of pigs at De'Mellow's Road. These are in immediate charge of a Superintendent aided by two Assistants. The number of sheep and goats slaughtered during the year was 4,09,504, the number of cattle 16,104 and the number of pigs 1,776. All carcasses before removal are stamped with the Corporation stamp and Superintendents of markets have orders to prevent any carcass not so stamped being exposed for sale. The Corporation maintained during the year nine bullock vans for distribution of sheep and goat carcasses, and piece-meat &c., to the several markets and stalls in the city. A uniform fee of 3 pies for every carcass, and of 6 pies for every loaded basket is charged. The total amount thus collected was Rs 3,241-7-0. This system has several disadvantages, the greatest being delay in the delivery of meat, especially to markets in the distant parts of the city. To avoid this butchers were allowed to use private carts, but these fell far short of sanitary requirements. To prevent the delay, and to ensure a sanitary method of delivery, the purchase of two motor meat vans has been sanctioned and these will be brought into use in the near future. During the year, the special Works Department have completed the new arrangements for disposal of all drainage water and washings from the

Slaughter House. After the solids are screened off, the water posses into a large well from which it is pumped into the main sewer by a portable Petrol Kerosine Pumping Set. The former unsatisfactory method of disposal is now abolished.

The right of collecting rents and fees for the use of the slaughter houses under Section 331, and of levying license fees as required by Section 334, is annually leased out and the total receipts under all heads including that for delivery of carcasses and removal of blood, amounted to Rs. 83,947-11-10 for the year 1913-14.

During the year permission was granted for the slaughtering of cattle, sheep, goats and pigs in private houses on occasions of religious ceremonies and festivals, and the numbers so slaughtered were 4 cattle, 1900 sheep or goats and 3 pigs. Every attempt is made to ensure that these applications are strictly *bona-fide*.

Illicit slaughtering.—A considerable amount of illicit slaughtering is carried on in the city and although Sanitary Inspectors were directed to inspect markets and meat stalls as often as possible, in order to discover carcasses not bearing the Corporation stamp, and to bring defaulters to book, no appreciable results were obtained. An additional difficulty in this connection is the importation of carcasses from the mofussil. It has been suggested that none of these should be admitted unless they bear the distinctive stamp mark of Mofussil Municipalities, and the Health Department is now in communication with these local authorities on the subject. Licenses for 1914 permitting sale of meat will include the following new condition :—

"Butchers shall not sell or expose for sale any carcass or, in the case of meat brought from outside the city, unless it bears a recognised stamp of the Mofussil Municipality or other station, whence it is brought"

Quality of meat.—The general quality of the meat exposed for sale within the city is exceedingly poor and is much below any accepted standard. An investigation was carried out recently at the Corporation Slaughter House during which 2000 sheep carcasses were weighed. The average weight was found to be $20\frac{1}{2}$ lbs. and only 300 of the 2000 were over 26 lbs. in weight while as many as 248 were under 15 lbs. The great majority of the animals were literally skin and bone. To ensure a better quality it is desirable that a fixed minimum weight should be laid down for all animals intended for human consumption. Under present conditions, a minimum of 18 lbs. is all that could be demanded but even this low minimum would exclude 15% of all the sheep now brought to the Slaughter House.

Condition of animals.—Before leaving this subject, reference may be made to a proposal made by Dr. Macdonald regarding the establishment of a quarantine depot for animals brought into the city for food purposes. At present, all such animals are taken to the slaughter house immediately after purchase, without any opportunity being given to the sanitary staff to observe their condition. The result is that only after slaughter are diseased animals detected. Were the above suggestion adopted, all animals brought into the city for slaughtering would be required to undergo strict examination by a veterinary officer who would issue permits for slaughter, and who would have the right to reject any animal he considered unfit for human consumption. Early action on these lines is desirable.

Markets-public and private. The Corporation maintains two markets *viz* : The Moore and the Smithfield markets. The right of collecting fees from the latter was leased out for the year 1913-14 for Rs. 4,300, while the collection of rents from the former is entrusted to the Revenue Department. Both the markets are, however, under the administrative control of this department and their sanitary condition was on the whole satisfactory. Various measures to effect further improvement were carried out.

There are 45 private markets within the city licensed by the License Branch subject to the control of the Health Department as to sanitary conditions.

These are divided by the Standing Committee into six classes. 10 of the private markets were granted unconditional licenses for the year, while the remaining 35 were granted licenses, subject to the carrying out of sanitary improvements within a time limit. Energetic measures were adopted to enforce regulations and Sanitary Inspectors were instructed to make frequent inspections. Whilst distinct improvement was noted in several instances, unsatisfactory conditions still prevail. Many of the markets are in charge of *Gumastahs* who are mere rent collectors and have no other aim in view than the increase of revenue. In the interests of public health, all owners, lessees, or contractors of markets should be compelled to appoint Superintendents, who have some sanitary qualification, or who are approved by the Health Officer. Under present conditions, overcrowding of the stalls is constantly in evidence and articles of food, as a consequence, are exposed in the gangways. On account of the unclean habits of the people this results in gross contamination. The sale of meat by persons suffering from skin disease was also frequently brought to notice and butchers' licenses were issued under section 350 of the Act only on production of a Medical Certificate from recognised Medical Practitioners stating that the applicants were in good health and not suffering from any skin disease. During the year attempts were made to extend overcrowded markets, such as those at DeMellow's Road, Kalmandapam Road etc., but little was accomplished.

Vegetable Markets.—There are two private vegetable markets for the whole city, the Kothawal Market in the North Range and the Bashiam Aiyangar's Market in the South Range. The former is the chief distributing centre for vegetables imported from the mofussil. The sanitary condition of these markets is fairly satisfactory. Small vegetable markets should be provided in some of the other divisions of the city, as, at present, vegetables are frequently exposed for sale on the streets, by the sides of the drains. As this is decidedly objectionable, attempts are being made to meet this want.

Sale of articles in streets.—With the sanction of the Standing Committee, sale or exposure for sale of articles in streets adjoining markets and in a few specified streets, was prohibited. 90 prosecutions against defaulters were instituted under Section 351.

Food and Drugs.—During the year the attention of the Health Department was particularly directed towards the work of inspection of foods and drinks. Constant supervision is required if the condition of food supplies of the city is to be improved. During the year under review a second Food Inspector was appointed and the Divisional Sanitary Inspectors, either independently or jointly, give their assistance. The Madras Port, the Railway Goods sheds, the Custom House go-downs, the markets, aerated water factories and other places used for storage and manufacture were systematically inspected, and unsound articles found therein were seized and destroyed. The authorities of the first three places co-operated with the Health Department in this work and the aid so given was invaluable. The main work of the Food Inspectors comprised the investigation of existing conditions under which articles of food are brought in for sale and are exposed for sale, the tracing of the sources of supply, and the discovery of the nature and extent of adulteration. These data are essential before any action can be taken, and by this means, a distinct advance was made during the year for a more comprehensive working of the sections and bye-laws in question. Vigorous action was taken by seizing, under section 354, articles which by changes in their appearance, odours, etc. could safely be pronounced unsound without subjecting them to searching chemical analysis, and destruction was carried out either with the consent of the party under Section 355 or under magisterial orders under Section 356. An appended list details the articles so seized and destroyed.

The question of the milk supply of the city was the subject of a Government Memorandum calling for an exhaustive report on the conditions prevailing in the city and

for remedial measures. A detailed memorandum has been submitted to Government, after being approved by the Corporation and is attached as an appendix (A) to this report.

No food inspection work will be thoroughly satisfactory unless carried out by men who have no religious scruples about the handling of all kinds of meat and drinks. Until a competent analyst is appointed to perform analyses and carry out bacteriological examinations of food stuffs, no recognised "standards" can be ascertained and fixed. In recognition of this need section 360 contemplates the appointment of an analyst. The sooner the proposed laboratory is provided, the more effective will be the control over food supplies. The Sections of the Act relating to food stuffs have been found to be defective in several ways and their revision has been noted for the pending amendment of the Act.

CONSERVANCY.

Street Conservancy Staff.—For purposes of Conservancy the City is divided into two ranges, each range being under the direct control of an Assistant Officer of Health. The Conservancy of each division is supervised by an Overseer aided by 3 to 6 peons, according to the size of the division. There are 103 Conservancy peons.

The details of the staff of coolies are given below:—

Sweeper Maistries	...	...	...	..	...	20
Street Sweepers	...	...	...	...	...	247
Side Cooly Maistries	...	...	...	...	...	20
Side Drain Coolies	..	...	...	...	...	233
Side Drain Boys	...	...	...	...	...	20
Syphon Coolies	...	...	...	...	...	64
Cess-pool Boys	...	...	...	...	...	47
Silt trap Coolies	...	...	...	...	...	44
Main Drain Coolies	...	...	...	...	...	30
Latrine men	...	...	...	...	...	90
Latrine women	...	...	...	...	...	91
Box Cartmen	...	...	...	...	...	77
Sewage Barrel Cartmen	...	...	...	...	...	57
Sewage Hand Cartmen	...	...	...	...	...	30
Reserve Coolies	...	...	...	...	...	27
Night Conservancy Sweepers	...	...	...	...	...	26

Bullock and Cart Depot Staff.—There are 8 Conservancy bullock and cart depots, each being under the charge of a Superintendent. These Superintendents are under the control of a Chief Superintendent who is responsible for all depots and so directly subordinate the Health Officer. The details of the carts are as follows:—

FOR THE REMOVAL OF RUBBISH.

Rubbish carts	...	...	...	...	...	258
Trolleys	...	...	...	...	...	19

FOR REMOVAL OF FILTH.

Iron night-soil carts	...	...	...	...	...	232
Lorries	...	...	...	...	...	14
Night-soil hand carts	...	...	...	...	...	24

FOR REMOVAL OF DRAIN SILT, SEWAGE AND SIDE SCRAPINGS.

Box carts	...	...	...	...	...	113
Sewage barrel carts	...	...	...	...	...	19
Sewage hand carts	...	...	...	...	...	30

The number of drivers employed is 636 excluding 40 reserve drivers.

Conservancy Bullocks.—1,284 bullocks remained on 1st January 1913. Of these, 53 died, 50 were sold as unserviceable, and 172 were purchased at a total cost of Rs. 9,489-0-9 thus leaving 1,353 at the end of the year.

Health of Bullocks.—The general health of the bullocks was comparatively better than in previous years. A few cases of foot and mouth disease occurred during January and 4 bullocks died of Anthrax. The introduction of antiseptic foot baths in addition to the usual precautionary methods adopted, prevented and arrested the spread of these infectious diseases.

Maintenance of Bullocks.—The total expenditure incurred during the official year for the maintenance of bullocks including the amount debited to Grant 1—2 Repairs—(c) Drainage was Rs. 1,82,163-3-6 against an estimate of Rs. 1,96,020-0-0 and against Rs. 1,88,219-7-1 in the previous year.

Maintenance of Labour.—The amount spent on labour employed for conserving streets and public latrines was Rs. 37,258-15-0 against Rs. 37,734-0-11 in 1912-13.

Improvement of Cattle Depots.—A new sick shed for bullocks was erected in Monegar Choultry Depot which was supplemented by another shed to accommodate 12 pairs of bullocks.

New Office and Store Rooms with grain sheds were constructed in Chulai Depot.

Low lands and stagnant pools in the Basin Road, Chulai and Harris Road Depots were reclaimed without cost to the Corporation.

The cart depots were re-gravelled and in some of them metalled roads were laid down. In several, avenue trees were planted to afford shade to the bullocks.

Superintendents, Quarters.—The Depot Superintendents start work at 5-30 A. M., and they are required to be present until late in the evening except for short intervals, while they are frequently called upon during the night to attend sick bullocks, etc. It would be of great advantage to the general conduct of depot work, were quarters provided for the Superintendents either in the Depots, or in close proximity to them. It must be remembered that the conservancy of the city depends upon the health of the bullocks and the Corporation should, as soon as possible, give this proposal serious consideration.

Scarcity of Conservancy Labour.—During the year there was constant difficulty in obtaining an adequate number of cart drivers and coolies. The steps taken to meet this difficulty were:—

(a) A sum of Rs. 10 was advanced to each cart depot Superintendent to employ drivers on daily wages.

(b) When a conservancy cooly did additional work either as Sweeper or Driver, the Corporation sanctioned extra remuneration of one anna for each half day.

(c) Despite these efforts, the situation was not improved and the Corporation arranged with Mr. N. Seshadri Raju, a private Conservancy Agent, for the supply of 100 coolies on daily wages. He was able to supply only 40 coolies in three batches. These coolies left the Corporation service within three months although special arrangements as regards housing, etc., were made as an inducement for them to stay.

(d) The Chief Superintendent, C. D., and an experienced Sanitary Inspector were sent to Nellore, Guntur and North Arcot Districts to recruit labour. They returned unsuccessful, in spite of the help rendered to them by the district authorities. The Collector of Ganjam was addressed regarding the possibility of securing Uriya labour for this work, as is done in Calcutta and Rangoon, but this attempt also proved futile.

Drivers' quarters are attached to two cart depots of the North Range. Lines close to the depots are of benefit in attracting and maintaining an efficient labour supply.

The real remedy however goes further than this. Many of the large employers of labour in Madras are now paying wages at the rate of Rs. 10 or more a month and the coolies naturally go where they can get the highest pay. It will become more and more difficult for the Corporation to maintain an efficient conservancy staff unless the rate of wages is increased. This question must be dealt with at a very early date.

Removal of Rubbish.—The total number of cart-loads of rubbish removed during 1913 was 3,24,202. Until September, to facilitate incineration, an attempt at rough and

hasty separation of combustible matters was made on the streets during collection. This method, however, did not conduce to tidiness, as there was much delay in the removal of incombustibles and moreover, the separation occupied a very considerable time. During the last months of the year therefore, all rubbish, whether combustible or incombustible, was removed direct to the incinerator and there separated. This system has thrown extra work on the incinerator staffs but the streets have presented a more tidy appearance. At the same time it is only fair to the Conservancy Department to add that until the people learn that side drains are not intended for the dumping of all sorts of house refuse and that the dust-bins are specially provided for its reception, the streets will always be dirty. It is a common experience to see quantities of rubbish thrown into the street a few minutes after the rubbish cart has passed. Merchants also make a habit of throwing all waste paper into the street and the Corporation should require all waste paper to be handed over packed in a gunny bag or similar receptacle.

60,067 cart-loads of filth were removed during the year. Hand removal of filth must always be highly objectionable. Considerable difficulty is experienced in finding stands for night-soil carts within easy reach of private toties and without being a nuisance to householders. If, on the other hand, filth carts are directed to follow the rubbish carts as they are compelled to do in certain places, the nuisance is no less great. The question of night-conservancy depends to a very large extent on street lighting, but the habits of people and the situation of house latrines are also factors which demand consideration in this respect. In those parts of the 13th, 14th, 15th, 19th and 20th divisions where bungalows exist, night-conservancy is carried on, but only when there is proper provision for storing filth in suitable covered receptacles, and where the latrines can be easily reached by the night-soil carts.

Removal of Silt and Side Scrapings.—61,107 cart-loads of silt and side scrapings were removed during the year. The objectionable practice of depositing silt in rubbish bins and on the sides of streets was mostly given up, direct removal into carts being insisted upon. The improved system of conserving side drains which was the subject of experiment in the 17th division, was continued with good results, and the special covered silt bins were found very useful for the storing of silt before removal. The extension of this system to other divisions is being allowed to lie over until the proposed reorganization of the Conservancy Section is taken in hand.

Disposal of Rubbish.—A very small part of the collected matter was dumped in rubbish depots where it was levelled and covered with layers of silt, side scrapings, or earth. The great bulk was incinerated either in the large or in the small incinerators. There are two large incinerators, one at Basin Bridge for the North Range and the other at Krishnam-pet for the South Range. These worked satisfactorily during the year. Dead rats and the dogs destroyed in the Lethal Chambers were burnt in the furnaces of the incinerators.

Two small incinerators were built during the year making a total of 36 at work throughout the city. One was built at the expense of a private party for reclamation of his tank and lowland, and the other at Oobrapoliem at the cost of the Corporation. The work done by these incinerators corresponds closely with that done in 1912. The total quantity of mixed rubbish received at the large and small incinerators amounted to 1,72,323½ cart-loads. Of this quantity, 1,46,100¼ cart-loads of rubbish were consumed by the furnaces, leaving 26,223¼ cart-loads of earth, etc. The resultant ash amounted to 26,943 cart-loads. With the ashes and screened earth from the small incinerators 4,88,898 cubic feet of land was reclaimed. A large quantity of the screened earth and ash from the Krishnam-pet incinerator was utilised for filling up lowlands, tanks and pits in the 19th division.

Disposal of Filth.—Night-soil was either buried in the Municipal Trenching Grounds and sold as manure, or crushed, liquified, and flushed into sewers at the Ice House Road Pail Depot, where 80 cart-loads from the four southern divisions were so disposed of daily. The amount realised during the official year by sale of manure from the trenching grounds

was Rs. 15,195-8-3. Many of these trenching grounds are not favourably situated. The stench vitiates the atmosphere within a radius of half a mile although every care is taken to avoid this by covering filth with dry earth immediately it is deposited. During the rainy season not only is there considerable difficulty in getting the carts to the trenching ground, but the trenches themselves are filled with water and dry earth is not available. Now that the Ice House Road experiment has proved so successful, similar night-soil depots should be constructed throughout the city, as only in this way will the intolerable nuisance associated with trenching grounds be eradicated.

Disposal of Silt, Side Scrapings and Sewage.—61,603 cart-loads of silt, side scrapings and sewage were deposited in rubbish depots, or on lowlands and in tanks where the silt was spread out, exposed to sun-shine and then used for covering rubbish or for reclamation purposes.

Throughout the city large quantities of sewage soak into the ground either because drains are lacking or because they are in a bad state of repair. A further quantity finds its way into the Cooum river-bed and the balance discharges into the sewers and is disposed of at the Tondiarpet Sewage Farm. Various improvements have been carried out by the Special Works Department on the farm which is under the supervision and control of the License Superintendent.

Collection and Removal of horse and cowdung in congested public thoroughfares.—A number of boys were posted in the main public thoroughfares for the purpose of maintaining them in a tidy and sanitary condition. The experiment has proved a success and its extension to other streets is recommended.

Conservancy carts.—25 Night-soil carts of the improved pattern, 17 Rubbish carts and 6 trolleys were added to the complement to suit new arrangements regarding disposal of rubbish. It is quite obvious that, without an increased supply of labour, any addition to the number of carts will serve no useful purpose.

Rubbish Bins.—518 corrugated iron dust-bins, large and small, and 11 fly proof rubbish bins were added during the year to the number already existing.

Notices and Prosecutions.—During the year 18 notices were served, all of which were complied with. The number of prosecutions instituted was 1,635 and convictions were obtained in 1,223 cases, leaving 412 cases pending at the end of the year.

Scavenging of Public Institutions, etc.—The amount realised by the supply of conservancy carts and coolies to private parties under Section 294 (b) and 295 of the Act was Rs. 7,069-9-4 against Rs. 6,993-15-2 for the last official year. The expenditure under this head was Rs. 2,108-10-6 against Rs. 2,131-4-0 for 1912-13.

This work has to be arranged for at the expense of the efficient scavenging of the division, and it is a question whether these public institutions should have precedence, and whether the toties employed by the Corporation for this work should not be utilised to make up the divisional complement.

Private Scavenging.—Complaints pour in from the public as to the irregular and unsatisfactory way in which private scavenging is done, and it is regrettable that the Corporation has no power to control the private toties at whose mercy the rate-payers are unhappily placed. Although under Section 227, all private latrines are under the control of the Corporation, when neglect is observed by, or brought to the notice of, the Health Department, all it can do is to proceed against owners or occupiers under Section 300 (5) for keeping filth for more than 24 hours. To remedy this situation the Corporation can adopt one of two courses, viz., either to exercise control by issuing licenses to all toties, or to undertake the whole of the private scavenging under Section 295. The latter course would undoubtedly be the better if the Corporation could command the services of the requisite number of toties, but under

the conditions at present prevailing in the labour market, the former is the only feasible method. In any case if street conservancy is to improve under existing conditions, steps should be taken to check by one method or another, the employment by private parties of Municipal toties, at least, during the hours they are doing Corporation work. The toties are not wholly to blame as the rate of pay given by the Corporation, as already stated, is not sufficiently attractive.

Defects in Conservancy and Remedies proposed.—The Conservancy system, as it now exists, presents many defects, the chief of these being:—

1. Shortage of labour. The difficulty is considerably increased by the coolies absenting themselves frequently for short periods.
2. Insufficient supervision by section peons over coolies who necessarily are working singly in different streets.
3. Lack of supervision on the part of Conservancy Overseers especially during the afternoons, when they know that officers are engaged in office work.
4. Dual control by the Health and Engineering Departments.
5. Want of co-operation on the part of the public, in carrying out the provisions of the Municipal Act.
6. Want of co-operation on the part of the Police and the Magistracy in reporting and in dealing with, breaches of the sanitary regulations.
7. Difficulty in working sections 293-300 of the Act.

Several of these points have been already discussed under previous headings, but it is necessary to add something more regarding the others. The question of dual control has always been a difficult one and it is hoped that the reorganization of Conservancy now being dealt with by the Engineer will cause its disappearance.

The Health Department has always found it a very difficult matter to carry through prosecutions made under sections 293-300 of the Act. This is partly due to defects in the regulations themselves, but is, for the most part, due to the inadequate fines imposed by the Magistrates' Court when convictions are obtained. A fine of 4—8 annas to a house owner or landlord is, to put it very mildly, a non-deterring punishment, and the people knowing that they will get off lightly, pay no heed either to the officers or the subordinates of the Health Department. Were a few heavy fines inflicted, immediate progress would be made, but as matters stand at present, it is anything but encouraging to the Health Officers to find perhaps two months time spent over a case in which the delinquent is fined a sum which any cooly could pay with equanimity.

VACCINATION

Reorganization of the staff.—Prior to the month of August the Vaccination staff consisted of 10 first class and 10 second class Vaccinators, with a supervising staff of one Deputy Inspector of Vaccination and three Assistant Deputy Inspectors. A reorganization was effected on 1st August, and the staff now consists of 10 Medical Vaccinators (Sub-Assistant Surgeons) and 10 assistants. It was considered desirable and safer to entrust the vaccination of infants to men with medical qualifications, as the results of operations performed by the previous men were considered far from satisfactory. These Medical Vaccinators were placed under the supervision of the Second Assistant Health Officer, who has also charge of the Plague and Vital Statistics Sections.

As this is the first occasion on which a report for the calendar year has been compiled, the results of the operations cannot be contrasted with those of previous years in all their details. Comparison has however been shown wherever possible.

Under the old arrangement, Vaccination operations were performed by all the 20 Vaccinators (both 1st class and 2nd class); but after the reorganization, by the 10 Medical Vaccinators alone. The principal duties of the Assistants are to assist the Medical Vaccinators in serving notices, in tracing out unprotected children and in clerical work.

Total cases for the year.—The total number of cases vaccinated during the calendar year, excluding secondary vaccinations, was 23,584 against 28,697 in 1912 showing a decrease of 5,113 cases. To account for this decrease it is necessary to consider the work of the vaccination staff before the reorganization, and that of the staff after the reorganization separately, and compare the same with the work performed for the corresponding periods during the previous year. The total number of cases vaccinated from 1st January to 31st July was 14,024 while the total for the corresponding period in 1912 was 18,010, showing a decrease of 3,986 cases. The total number of cases vaccinated by the Medical Vaccinators from 1st August to 31st December 1913 was 9,560, while the total for the corresponding period in 1912 was 10,687, showing a decrease of 1,127 cases.

It is evident, therefore, that the old staff are responsible for nearly four-fifths of the total decrease. Knowing that they were to be superseded by Medical men and pensioned off they performed their duties in a perfunctory fashion and without enthusiasm or energy. The Medical Vaccinators and their assistants took some time to settle down and to become acquainted with their respective divisions, and this may be taken as an explanation of the decrease of 1,127 cases for which they are responsible. The constant supervision which has been made possible by the appointment of an additional Assistant Officer of Health should also result in improvement. Of the total number vaccinated, 20,533 cases were successful and 1,780 unsuccessful. In the remaining 1,271 cases the results could not be verified and are shown as "unknown."

Including the vaccinations performed in the Penitentiary (825) and at the British Guiana Government Emigration Depot (56), the total number of primary vaccinations and revaccinations in the city was 24,465, 14,251 males and 10,214 females. Of the total, 21,171 were successful, and 2,012 were unsuccessful. The remaining 1,282 were returned as unknown.

Of the 23,584 cases vaccinated by the Corporation staff, 16,401 were vaccinated in the Depots and 7,183 in the divisions. Of the 16,401 cases vaccinated at the Depots 13,956 were primary, and 2,445 re-vaccinations. In the cases of the former, notices were served according to the by-laws to the parents or guardians to produce the children for verification of results at the depots, and 8,243 were so produced. The cases vaccinated outside the depots were verified in the division, and operations in these cases were confined

as usual to the poorer classes located in paracheries, hutting grounds and kuppams, and to the floating population who could not be compelled to attend the depots. The total number of cases verified by the Deputy Inspector of Vaccination and his three Assistants up to the date of their retirement was 8,584. After the reorganization, this work of verification devolved on the Assistant Health Officer in charge, and he has found time to verify only a small number of cases.

Percentage of successes.—The percentage of success obtaining in Primary and Secondary vaccinations and in re-vaccination cases excluding the unknown from the total was 97.19 and 58.43 against 95.13 and 61.74 respectively in 1912. The lymph used in all these cases was the glycerine lymph obtained from the King Institute.

A comparison of the work performed in the several vaccination depots shows that the Vepery Depot has the highest total with 4,495 cases. The highest percentage of success, *viz.*, 97.72 was obtained in the Mint Street Depot.

Out of the 24,465 cases vaccinated, 19,840 were primary and 4,625 were re-vaccinations. In 470 of these re-vaccinations, a reward of four annas each, sanctioned in G. O. No. 149-M., dated 5th February 1909 was paid. A register was maintained showing the names and addresses of all persons to whom such rewards were paid, and these people were mainly inhabitants of localities where small-pox broke out. The rewards were paid by the Assistant Health Officer in person. A list of the names and addresses of all the persons to whom these rewards are paid is submitted to the Health Officer within 24 hours of such payments, and a quarterly statement is submitted to the President for his information.

Children under one year of age.—Vaccinations among children under one year numbered 17,003. The percentage of success among these, excluding unknown from the total, was 97.86 against 95.22 in 1912. Of the total number of children vaccinated by the Corporation staff, 10,355 were born in Madras, and 6,648 in the mofussil.

Verification of births.—The total number of births verified was 16,371. Of these 3,841 children died during the year. 3,030 were reported to have permanently left the city, and 818 were not traceable at the addresses given in the birth counterfoils. Of the remaining 8,682, 7,151 were vaccinated. Vaccination was postponed on medical certificates in 249 cases, 684 were found sick by the Vaccination staff and 442 had temporarily left the city. The remaining 156 children were found healthy, and the parents were warned to have them vaccinated without delay. The system of making enquiries to find out whether children born in the city and removed out of it before vaccination were vaccinated outside, was continued during the year under report, and resulted in the vaccination of 29 cases. The results of such cases were noted in the registers.

Hospital Births.—Hospital births numbering 2,939 were verified. Of these, 537 children died during the year; 776 were reported to have permanently left the city and 772 were not traceable at the addresses given in the birth counterfoils, leaving 854 available for vaccination. 665 of these were vaccinated. Vaccination was postponed under medical certificate in the case of 12 children, 60 were found sick by the vaccination staff and 105 temporarily left the city; the remaining 12 children were found healthy and the parents were warned.

The large number of untraced cases among hospital births is due in many instances to the insufficient and incorrect addresses furnished by the Hospital authorities but this is very probably due to parents and friends themselves giving erroneous information.

The attached statement (I) furnishes information as to the number of children born in the city in 1913 who were vaccinated before they attained the age of one year.

Analysis of totals according to race.—Out of 24,465 cases vaccinated, 1,425 were Europeans, Anglo-Indians and Indian Christians, 1966 were Mahomedans, 20,917 were Hindus and 157 other classes. For every 1,000 of the population according to the Census

of 1911, 47.16 were vaccinated. The vaccination of "other classes" was proportionately larger than that of any other class, the number vaccinated being 8.87 per cent. of the population, while the percentage among the Hindus was 5.02; among Europeans 3.41 per cent., and among Mahomedans 3.32 per cent.

Small-pox cases.—During the year Small-pox was present in the city only in sporadic form. A few cases were also imported. All possible efforts were made to check the progress of the disease. Infected houses were disinfected by the Sanitary staff. Small-pox patients were isolated either at their own houses or at the Isolation Hospital when accommodation in their houses was found insufficient. Infected houses and the surrounding houses were frequently visited by the Vaccination staff, in order that all unprotected children in the locality might be vaccinated, and re-vaccination was pushed in the infected areas as much as possible. Schools were frequently visited and steps taken to vaccinate the unprotected children attending there. The female Vaccinator was directed to make house to house visits and to get in touch with the women. The Managers of large mills in the city were requested to prevail upon their workmen to undergo re-vaccination. Re-vaccination on payment of reward was also carried out in the infected localities, but there is, generally speaking, strenuous objection to re-vaccination even among small-pox contacts.

There were 136 attacks and 34 deaths from Small-pox during the year. Of these attacks, 42 were amongst children under 12 years of age, of whom 26 were vaccinated in infancy and 16 were not vaccinated. Of the vaccinated, seven died, and of the unvaccinated, ten. The remaining 96 attacks were among persons over 12 years of age, of these 78 were vaccinated in infancy, and 18 had never been vaccinated and 6 of the unvaccinated proved fatal.

Attacks and deaths from Small Pox—The following table is a statement of attacks and deaths from Small-pox among the vaccinated and the unvaccinated at the various age periods.

	Vaccinated.		Unvaccinated.	
	Attacks.	Deaths.	Attacks.	Deaths.
Under 1 year	4	...	9	9
Above 1 year & under 5 years	4	2	4	1
Above 5 years & under 10 years	15	3	1	...
Above 10 years & under 12 years	3	...	...	...
Above 12 years & under 15 years	7	1	...	...
Above 15 years & under 20 years	18	1	3	1
Above 20 years & under 25 years	23	4	5	3
Above 25 years	30	7	10	2
Total	104	18	32	16

Admissions to Isolation Hospitals.—Information as to the vaccinal condition of small-pox patients admitted into the Corporation hospitals during the calendar year 1913 is hereunder furnished as required in G.O.No. 992-Public, dated 21st October 1910.

1. *Krishnampet Isolation Hospital.*—There were 2 cases of small-pox remaining on 1st January and 36 were admitted during the year, making a total of 38. Of these 31 were protected and 7 were unprotected. There was no death among the protected cases, while there were four deaths among the unprotected.

2. *Native Infirmary.*—Of the 13 cases admitted, 8 were protected and the remaining five were unprotected. There were no deaths among the protected and three among the unprotected.

Prosecutions.—The total number of prosecutions instituted during the year under report was 53. The fines imposed amounted to Rs. 44-12-0. In all these cases prosecution was resorted to for failure to have children vaccinated, with the result that 32 of them were subsequently vaccinated. In 17 cases the parties were warned and discharged and in 4 cases the children died before the case was called for hearing.

Fees.—The fees charged for primary vaccinations at private residences under by-law 233 amounted to Rs. 53-8-0. The amount was collected and credited to the Corporation

Total cost of Vaccination.—The cost of vaccination was Rs. 13,438-11-7. If the amount realized by vaccination at private residences is deducted, the net expenditure amounts to Rs 13,385-3-7. The net cost of each successful vaccination was 10 annas and 5 pies, against 8 annas and 1 pie in the previous year. The increased cost is partly due to rise in the cost of establishment by the appointment of Sub-Assistant Surgeons as Vaccinators, and partly to the supply of new furniture to all the Vaccination Depots.

The results under review cannot be considered altogether satisfactory, although there is an appreciable increase in the percentage of successful vaccinations. It is too soon to attempt to estimate the efficiency of the operations of the reorganised staff as their work embodied in this report is only for the latter five months of the year, the most unfavourable months for vaccination.

PLAQUE.

Plague Measures.—Plague measures continued to be administered by the Assistant Health Officers of the two ranges under the supervision of the Health Officer until August, when a separate Assistant Health Officer took charge of Plague, Vaccination, and Vital Statistics. Owing to the outbreak of plague in Negapatam, a town in the Tanjore District, a plague passport station was opened for South Indian Railway passengers at Chetput in December 1913, vide G. O. No. 683 P. D., dated 23rd December 1913.

No cases of indigenous plague occurred in the city, but four cases of suspected plague were imported from Rangoon, Ambur, Avalkonda and Raichur. Bacteriological examination demonstrated the presence of plague bacilli in the first two cases. The examination in the last two cases proved negative. One of the latter cases died of diabetes; and the other was found to be suffering from "consumption" and was discharged from hospital.

Passports.—During the year under report 1,30,709 passports were issued at Basin Bridge, Perambore, Ponneri and Chetput, of which 1,01,374 passports related to the city and 29,335 to the mofussil. At the Madras Harbour 1,282 city and 698 mofussil passports were issued. Out of a total number of 1,02,656 city passports, 1,224 or 1.192 per cent. could not be traced, as against 1,354 or 1.357 per cent. in the previous year (1912-13). The number of mofussil passports dealt with by the city staff was 1,754, of which 12 or .684 per cent. were untraced as against 45 or 1.789 per cent. The number of prosecutions instituted, and convictions obtained, for infringing the plague regulations during the year was 22 and 12 respectively against 30 and 24 in the previous year.

Port Health Officer's Report.—The Port Health Officer reports as follows:—

"231 out-going vessels carrying 23,831 persons as crews and 38,385 as passengers were inspected during the year and granted Bills of Health. 167 incoming vessels, arrived from plague infected ports carrying 16,816 persons as crews and 41,197 as passengers for Madras. The bedding and effects of deck passengers and native crews embarking for places out of India were disinfected prior to embarkation, as were also the effects of deck passengers and native crews disembarking from plague infected ports. One case of plague, three cases of chicken-pox, three cases of small-pox, and two cases of cerebro-spinal meningitis were removed from vessels calling at this port. They were sent to the Isolation Hospitals at Krishnampet and Egmore, and to the Fiji Emigration Depot at Cassimode. First and second class passengers arriving from plague infected parts were passported. The number of passports issued at Madras Harbour for the year ending 31st December 1913 is as follows.—

City	...	...	...	...	Rs. 1,282
Mofussil	...	...	...	...	698

Rat Destruction.—The work of destruction of rats was carried out during the year under the supervision of a Special Medical Officer. The number of rats caught during the year was 1,24,217 as against 1,52,672 in the previous year; thus bringing up the total to 17,03,585 since the beginning of the operations. No plague infected rats were detected during the year.

VITAL STATISTICS.

Area of the City	...	...	...27·5 Sq. miles or 17,600 acres.
Census Population of 1911	...	...	...5,18,660.
Average density	...	...	...29·5 per acre.
Density of 7th 8th and 9th Divisions	...	...	...132·6 do.
Density of 14th and 15th Division.	...	...	... 10·1 do.
Inhabited houses	...	...	...59,595.
Number of persons per house	...	...	... 8·6
Births	...	...	...20,112 (including still-births) against 20,773 in 1912.
Deaths	...	...	...20,675 against 20,132 in 1912.
Infantile Mortality	...	...	...293·4 deaths per 1000 infants born alive in the year against 280·0 in 1912.
Estimated Population for the middle of the year 1913.	...	...	5,20,756.

Registration of Births and deaths.—Births and deaths are registered in accordance with Sections 375 to 385 of the Madras City Municipal Act of 1904. Prior to June 1910, eight lay Registrars were in charge of the District Registration offices of births and deaths, but in that month Sub-Assistant Surgeons were substituted. In August 1913, the number of Medical Registrars was raised to ten for the twenty divisions. In addition to the Medical Registrars, fourteen Conicopillays are employed in searching out and reporting cases of birth. Sanction has been given for the entertainment of six additional Conicopillays from 1st April 1914 thus giving one Conicopillary to each Municipal Division. Under present arrangements the Conicopillays come to the Health Office daily to consolidate the divisional reports. In travelling to and from their divisions much time is wasted and now that the registration is wholly in the hands of medical men, it is proposed to make the Registrars themselves responsible for the Vital Statistics of their own divisions and Conicopillays will attend only at the Registrar's Offices to assist in the compilation of the weekly reports. This should give them more time to spend in tracing out births and in this way the number of births that escape registration should be considerably decreased.

In course of time registration of births and deaths is likely to become more popular, and even now there is a considerable demand for authenticated certificates. A table showing the number of certificates issued from the Health Office for the last three years may be of interest. The large proportion of death certificates is in all probability due to the demand from Insurance Offices of authenticated evidence of death:—

1911.		1912.		1913.	
Births.	Deaths	Births.	Deaths.	Births.	Deaths.
65	174	102	221	109	275
Total... 239		323		384	

A great deal remains to be done before these statistical returns, especially those relating to births, can be considered accurate. Caution has therefore to be exercised in drawing any conclusions from these figures, although we may fairly draw inferences whenever the returns show marked fluctuations from the average. As in previous years, the births and deaths are calculated on the previous (1911) Census population, and not on the estimated population.

Births.—The total number of births registered for the whole city for the year 1913 was 19,470, 9,934 being males and 9,536 females, giving a birth rate of 37.5 per 1,000 of the population, and, inclusive of still-births, a rate of 38.7 per 1,000.

TABLE A.

Table of Births and Birth-rates during 1908—1913.

Year.	Population.	No. of Births registered.	Birth-rate per 1,000 of population.
1908		19,980	39.2
1909	5,09,346	18,981	37.2
1910		19,340	37.9
1911		19,735	38.3
1912	5,18,660	20,099	38.8
1913		19,470	37.5

Table A shows for comparison the total births with rates for the five previous years. The rate shows a general tendency to fall and this would be more obvious if the rates were calculated on the estimated population. The figure for the current year would be then 37.4 per 1,000.

TABLE B.

Table of Birth-rates for the different races of the city for 1912 and 1913.

Race or Caste.	Population by the census of 1911.	Birth-rate for 1912.	Birth-rate for 1913.
Europeans	4,187	13.6	22.7
Anglo-Indians	10,332	38.0	40.7
Indian Christians	27,293	33.2	30.8
Hindus	4,15,910	38.9	37.6
Mahomedans	59,169	43.5	42.0
Others	1,769	2.3	...
Total	5,18,660	38.8	37.5

Table B shows that the Mohammedan community has the highest birth-rate and the Europeans the lowest. The three sections of Indians, viz., Indian Christians, Hindus and Mohammedans all show considerable decreases in birth-rate, while the Anglo-Indian and European communities show remarkable increases. The monthly incidence of

births is shown in Table C, and graphically in Graph II, for the years 1911, 1912 and 1913.

TABLE C.

Births by months during the years 1911, 1912 & 1913.

Months.		No. of Births registered in 1911.	No. of Births registered in 1912.	No. of Births registered in 1913.
January	...	1,598	1,563	1,507
February	...	1,381	1,285	1,107
March	...	1,527	1,376	1,334
April	...	1,434	1,348	1,492
May	...	1,603	1,454	1,605
June	...	1,443	1,732	1,577
July	...	1,709	1,804	1,737
August	...	1,860	1,945	1,920
September	...	1,945	1,800	1,925
October	...	1,872	2,042	1,941
November	...	1,709	1,921	1,636
December	...	1,654	1,829	1,689
Total ...		19,735	20,099	19,470

It seems to be the rule that August, September and October are the most productive months, as these show an increase of as much as 20—40 per cent. over the months of January and February in each year. The greatest number of conceptions therefore take place during December, January and February *i.e.*, the cold weather. A comparison with the death-rate shows that the month of maximum birth rate coincides with the month of minimum death-rate.

Comparison of birth-rates of Bombay, Calcutta, Rangoon and Madras.—

Madras	...	...	...	...	...	37.5
Bombay	...	...	...	...	...	21.9
Calcutta	...	...	...	...	...	21.7
Rangoon	...	...	...	...	...	18.25

The birth-rate of Madras therefore compares favourably with that of other large eastern cities, but it is difficult to understand why there should be such remarkable variations.

The Census of 1911 gives the number of potential mothers, *i.e.*, women between the ages of 15 and 45 years, as 1,29,803. The percentage of child-bearing women between these ages to the total female population is 51.5, while in England it is 46, and the birth-rate per cent of females between 15 and 45 years is 14.9, as compared with 10.5 in England and 14.3 in Bombay. As the number of births in 1913 was 19,470, the birth-rate calculated per 1000 of the female population between the ages of 15 and 45 years, is 149.9. The corresponding ratio for Bombay in 1911 is 143.5 and for England and Wales it is 105.1.

Birth-rates in the different Municipal Divisions in the city.—The Divisional birth-rates (see annual Form No. I) demonstrate some interesting points. The highest rate was found in the 10th (Perambur) Division, probably one of the most sparsely populated divisions, whilst the lowest birth-rate was found in the 8th and 9th divisions of Georgetown, two of the most overcrowded centres of the city. That this was not by any means the only factor of influence, however, is shown by the fact that the three divisions of Tondiarpet which cannot be said to be at all overcrowded showed the next lowest birth-rates. This will be again referred to in connection with Malaria.

The 17th and 18th divisions, largely populated by Mohammedans, showed also a very high rate, a natural corollary to the generally high birth-rate of that section of the community.

Illegitimate Births.—There were 897 such births in 1913 as against 1,025 in 1912. This very considerable decrease is possibly due partly to an increased marriage rate and partly to incomplete registration as the registration of this class is almost certainly more incomplete than that of any other.

Still Births.—The number of still-births recorded was 642 in 1913 (674 in 1912). The percentage of still-births to the total live births was 3·3. From the fairly high percentage we may surmise that the information is fairly correct. Year by year the numbers show a small but gratifying decrease (See Table D). Whether the decrease is due to a spread of knowledge of the hygiene of pregnancy is a doubtful inference.

TABLE D.

Year.	Still-births.	Illegitimate births.	Hospital births.
1908	730	1,136	3,409
1909	743	1,207	3,368
1910	673	1,166	3,347
1911	665	1,132	3,532
1912	674	1,025	3,375
1913	642	897	3,687

Births in Hospitals.—18.9 per cent of the registered births in the city were hospital births. These were distributed as follows.—

Government Maternity Hospital	...	...	...	2,023
Rajah Sir Ramaswami Mudaliar's Maternity Hospital		...	...	789
Victoria Caste and Gosha Hospital	...	...	...	667
The Medical Mission Hospital Rayapuram	...	...	...	104
Kaliyani Hospital	...	...	...	104
			Total	3,687

In 1912 the corresponding total was 3,375.

The large increase would seem to point to an increased belief among the people in the benefits to mother and child to be derived by attendance at these institutions.

Infantile Mortality.—The number of deaths registered as occurring amongst children under one year of age was 5,713. The death rate when stated as a proportion of deaths of infants under one year of age to the total number of births registered during the year is found to be 293.4.

Graph IV shows the rates of infantile mortality per 1000 births for the six years from 1908 to 1913. The year 1911 was a very fatal year, the rate being as high as 305.4. The abnormal decrease during 1912 probably only means that most of the weaklings died during 1911 because the 1913 level is practically continuous with the rate of decrease occurring during 1908-1910.

It must be pointed out, however, that high as the infantile death-rate is, these figures are somewhat misleading. This is due to the fact that the registration of deaths is much more accurate than that of births and many children whose deaths are registered have never been registered as born, due either to ignorance or neglect on the part of the parents. On the assumption that 10 per cent. of all births escape registration, the corrected birth-rate would be 42.5 per 1000 of the population, and the rate of infantile mortality would be 258.2. This figure, for a city like Madras, does not compare very unfavourably with 228.3 per 1000 for the whole of India and is probably fairly accurate. 5,713 deaths of children under one year of age were registered, 3014 being males and 2699 females. 1555 lived under seven days and 2523 or 44.16 per cent. of the total died before reaching the age of 30 days.

Seasonal Incidence.—November, December and January were the months showing highest death-rates but there was no very marked rise or fall during the year, a fact which would seem to prove that the influences at work were present throughout the year.

TABLE E.

Table of Infant Mortality by months in the year 1913.

Months.	Debility.	Nervous Diseases.	Respiratory Diseases.	Intestinal Diseases.	All other causes.	Total.			
						Males.	Females.	Total.	
January	...	5	146	85	153	181	295	275	570
February	...	8	95	51	108	114	195	181	376
March	...	2	100	59	134	156	230	221	451
April	...	5	110	48	130	116	226	183	409
May	...	9	122	57	138	130	219	237	456
June	...	8	112	84	167	143	255	259	514
July	...	25	139	62	159	134	271	248	519
August	...	24	99	61	126	129	245	194	439
September	...	13	148	66	89	91	239	168	407
October	...	21	176	90	95	120	268	234	502
November	...	15	159	93	112	153	285	247	532
December	...	10	168	80	140	140	286	252	538
Total	...	145	1,574	836	1,551	1,607	3,014	2,699	5,713

Age Incidence.—Of the 5,713 deaths, 1,555 or 27.22 per cent. died in the first 7 days of life while 2,523 or 44.16 per cent. died within a month of being born. 4,044 of the children died before reaching the age of six months.

TABLE F.

Table of Deaths among Infants under 1 year of age from Principal Causes by Age periods in the year 1913.

Age periods.	Small-pox.	Measles.	Malaria.	Ague and Remittent fever.	Diarrhoea and Dysentery.	Premature birth.	Debility.	Nervous system.	Respiratory system.	All other causes.	Total.	Percentage of deaths in each age period to total deaths under 1 year of age.
1 to 7 days ...	...	...	...	...	43	755	72	502	88	95	1,555	27.22
7 to 30 days ...	...	5	1	3	153	93	51	461	97	104	968	16.94
1 to 3 months.	3	...	2	15	194	14	8	202	119	71	628	10.99
3 to 6 months	1	4	10	36	361	1	9	223	161	87	893	15.63
6 to 9 months.	3	12	24	44	416	...	1	117	204	76	897	15.70
9 to 12 months.	2	9	19	46	384	...	4	69	167	72	772	13.51
Total ...	9	30	56	144	1,551	863	145	1,574	836	505	5,713	...

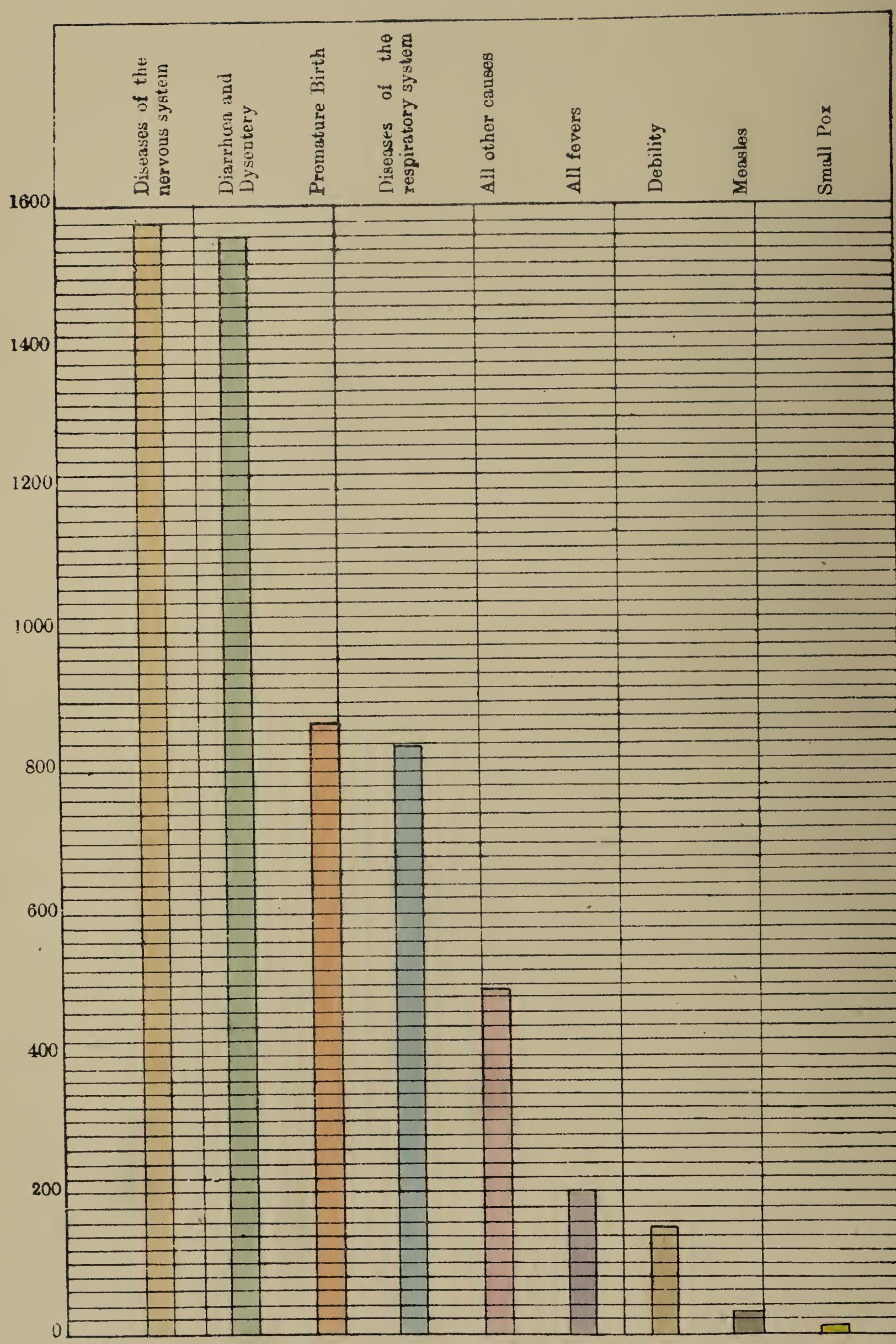
Infantile mortality according to race or caste.—From the table it will be seen that the infant death-rate among Mohammedans was very much the highest, viz., 353.3 per thousand births. This is probably partly due to the purdah system whereby Mohammedan women are prevented from availing themselves of skilled medical advice and from taking advantage of the Maternity Hospitals. At the same time it is to be remembered that a high birth-rate is usually accompanied by a high infantile death-rate.

TABLE G.

Table of Mortality among Infants, and Death rate per 1000 of Births registered in each race during the year 1913.

Race or Caste.	Deaths under 1 year.	Number of Births registered.	Infant mortality per 1000 of births in the race.
Europeans ...	14	95	147.4
Anglo-Indians ...	58	421	137.8
Indian Christians...	228	840	271.4
Hindus ...	4533	15629	290.0
Mahomedans ...	878	2485	353.3
Others ...	2	...	...
Total ...	5713	19470	2934.

Causes of Infantile Deaths



Infantile mortality according to Municipal Divisions.—From Graph III it will be seen that in the 3rd division the infantile death-rate was 467.7 much the highest of all the divisions, while the first three divisions, which include the whole of Tondiarpet, showed a much higher-rate than any other division. The lowest rates are to be found in the 14th and 15th divisions (Kilpauk and Nungambakam). That the infantile mortality rate is not due to over-crowding *per se* is shown in graph VI. Divisions 5, 6 and 8, which are most densely populated, show a comparatively low infantile death-rate, Divisions 17 and 19 with a comparatively sparse population exhibit a high death-rate.

TABLE H.

Table of the Ratio of Deaths among Children under 1 year, per 1000 of Births registered in each Ward during 1913.

Present Divisions.	Wards.	No. of the Corresponding old division.	Ratio of Deaths.	
1	East Ward	...		380.7
2	Centre "	...	1	395.7
3	West "	...	1	467.7
4	East Ward	...	1	353.4
5	Centre "	...	3	326.2
6	West "	...	3	308.2
7	North Ward	...	2	293.5
8	Centre "	...	2	331.3
9	South "	...	2	352.8
10	4th Division	...	4	240.4
11	North Ward	...	4	289.1
12	Centre "	...	5	275.0
13	South "	...	5	243.4
14	North Ward	...	6	192.7
15	South "	...	6	198.1
16	North Ward	...	7	247.8
17	Centre "	...	7	281.3
18	South "	...	7	233.9
19	East Ward	...	8	290.3
20	West "	...	8	271.7
				293.4

The general curves of total mortality and of infantile mortality, by their close similarity and coincidence in rise and fall, lead one to conclude that the same causes are at work amongst adults as amongst infants to a greater or less extent, and when one plots out the dysentery and diarrhoea rate and the malaria rate, one can see that these also follow more or less the same rises and falls in the same divisions.

Causes of Infantile Mortality.—Diagram No. I shows the main causes of mortality. "Diseases of the nervous system" and "Diarrhoea and Dysentery" account for 27 per cent. each, *i.e.*, 54 per cent. in all, of the deaths amongst infants under one year of age. "Premature Births" is the cause of death in 15 per cent. and "Diseases of the Respiratory System" are responsible for 14 per cent. "All fevers" does not show as large a percentage (7 per cent.) as might have been expected, whilst infectious diseases like small-pox and measles have had little or nothing to do with the high death-rate amongst infants.

TABLE I.

Table of Percentages of Infant Deaths from Principal Causes in the year 1913.

Age period.	Small-pox.	Measles.	Malaria.	Ague and Remittent Fever.	Diarrhoea and Dysentery.	Premature birth.	Debility.	Nervous system.	Respiratory system.	All other Causes.	Total.	
1 to 7 days	2·76	48·55	4·63	32·28	5·65	6·10	27·22	
7 to 30 days	·51	·10	30	15·80	9·60	5·26	47·62	10·02	10·74	16·94
1 to 3 months	...	·47	...	·31	2·38	30·89	2·22	1·27	32·16	18·94	11·30	10·99
3 to 6 months	...	·11	·44	1·11	4·03	40·42	·11	1·007	24·97	18·02	9·74	15·63
6 to 9 months	...	·33	1·33	2·67	4·90	46·37	...	·11	13·04	22·74	8·47	15·70
9 to 12 months	...	·25	1·16	2·46	5·95	49·74	...	·51	8·93	21·63	9·32	13·51
Total	...	·15	·52	·98	2·52	27·14	15·10	2·53	27·55	14·63	8·83	...

Diseases of Nervous system.—The term "Diseases of the Nervous System" means practically nothing but "Convulsions," in children under one year of age, and "Convulsions" is only a symptom and not a disease *per se*. The usual causes of convulsions in children are (1) reflex causes originating in the bowels, including "dentition;" "worms" etc., (2) acute infectious diseases; (3) malnutrition and inherited debility of the nervous system, and (4) cerebral diseases. This outstanding symptom has masked the underlying true causes of the cerebral irritability, and therefore it would be unsafe to draw any important inference from these figures, without further enquiry.

963 or 61 per cent. of the 1,574 registered under this heading died during the first month of life and proportionately fewer deaths are recorded as the children approach the age of one year. This would lead one to the conclusion that the main cause of death was some factor exerting its greatest influence during the first month of life, and when one finds in addition that 848 deaths are registered under the heading "Premature Births" it may be definitely stated that the majority of the deaths from "Convulsions" are due to some "malnutrition or debility on the part probably of both mother and infant." The causes for these conditions have to be sought for in the social and economic conditions that aggravate the sanitary imperfections inseparable from an overcrowded community. Young and inexperienced motherhood, and the barbarous treatment of untrained barber women, which no doubt frequently results in umbilical sepsis and tetanus, are also factors which must be taken into account, as well as ignorance of even the simplest rules of hygienic living on the part of the mother, even when poverty is not a factor in the case. Graph XII shows that the highest death-rate from this cause was in October which, as might be expected, coincides with the month of highest birth-rate.

Diarrhoea and Dysentery.—27 per cent of the children who die under one year of age are carried off by Diarrhoea and Dysentery. The number of cases registered under this heading is probably fairly correct. This conclusion is come to from a study of the table of deaths by age-periods, which shows that the incidence of these diseases rises continuously until the end of the 9th month when a slight decrease occurs up to the 12th month. This is what might be expected, as fewer and fewer children are fed on mother's milk as they approach the age of one year, and larger numbers are therefore fed on cow's milk or patent foods, or share the parent's food. Little or no relation seems to exist between the infantile deaths from these bowel diseases and the temperature and rainfall, and therefore the conclusion is that "bad feeding" is the chief cause, and a good and pure milk supply would go far to reduce this great loss of life. Graph XII shows that the highest monthly death-rate from these causes was found in the month of June, which is nine months after the highest birth-rate, while the months of September, October and November showed by far the lowest monthly death-rates from these diseases.

Premature births and Debility.—These two causes have been combined as they are probably closely related in their true origin. This heading ranks third in the list of important causes of infantile mortality, and, as might be expected, the first week of life was the most fatal, 827 out of a total of 1008 dying during that period. Many of these premature births were probably due to some inter-current disease in the mother, e.g. malaria, and from Annual Form No. X it is seen that 5.5 females per 1000 of the population died of Malaria. These figures and the figures for the next year should make an interesting comparison as by that time the effect of the work of the Malaria Nurses employed by the Corporation should be evident.

Respiratory Diseases.—In 1913, 14.63 per cent. of the infantile deaths were registered as due to this cause. From "the age periods" table of deaths, it is seen that these diseases were steadily on the increase from the first week of life up to the 9th month. A curious increase in the monthly incidence took place in June, but, as might be expected, with this exception the average rate was low except during the months of October, November, December and January, the months of the rainy season.

Malaria, Ague, and Remittent Fevers.—No deaths from these causes were registered during the first seven days of life, and only four during the first month of life. But on the other hand only 200 deaths were registered for the whole year as being due to these causes, and this figure must be absolutely wrong. The probability is that many deaths registered as convulsions—for as many as 425 deaths from that cause were registered among children from 1 to 6 months old—were really due to Malaria, the convulsion being merely the terminal complication of that disease.

Causes which produce a high infantile mortality are chiefly :—

1. Marriage of immature females.
2. Employment of women before and after labour.
3. Ignorance on the part of the mothers.
4. Insanitary surroundings.
5. Poverty.
6. Alcoholism.
7. Syphilis.

All these causes are found to exert their full influence towards increasing the infantile mortality of Madras, and any scheme for lowering the high death rate must take cognisance of each of these factors. Probably ignorance of the mother in regard to proper methods of feeding is the most important, although every one realises that it is practically impossible to get a pure milk supply under present conditions. Insanitary surroundings, both inside and outside the house, and the employment of women up to the day of labour are natural sequences to the

poverty which crushes the lives of the poorer classes. Alcoholism and syphilis are not the least important or the least frequent causes of premature births, and the birth of dead, or delicate children.

That as many as 44.16 per cent of all children dying under one year of age died before they were one month old shows unmistakably that antenatal causes such as alcoholism, syphilis &c., were causing great harm.

Prosecution for failure to register births.—There were no prosecutions during the year.

Remedies suggested.—See Milk Report (Appendix A). Enquiry has elicited the information that in Madras City there are about 220 women who practise midwifery, and of these only 17 are qualified in any way. The remaining 200 are either barber women or dhoby women, who know nothing of the art and practice of midwifery. To spread knowledge regarding the hygiene of pregnancy and parturition, vernacular leaflets may be useful, but a number of Corporation midwives should also be employed. A midwife should be appointed to each district and it would be her duty to constantly visit the poorer communities, to talk to women on domestic and personal hygiene, to find out and advise prospective mothers, and to attend at confinements and warn against prenatal and post-natal influences adverse to infant-life. In addition these midwives would form an effective agency for a more complete registration of births, and would be able to supplement the work done by Registrars and Conicopillays. "Gosha" houses, which Sanitary Inspectors are unable to enter, could be visited by them and cases of infectious diseases in these houses reported.

An almost equally important step is the education, registration and licensing of the barber women. A new section should be added to the amended Act prohibiting these women from attending confinements without being licensed, and only women who have training certificates should be licensed. While these methods for reduction of mortality in puerperal women and in newly-born children are in evidence in England in the form of a Midwives Act, under which all midwives are controlled by a central Midwives Board, and in the Infant Life Protection Act, at the same time mention must be made of the valuable aid which a Voluntary Workers' Association could give the Health Department in this direction. In European cities these associations have been doing valuable work for some years, and as regards the social life of the community "there is probably no sphere of philanthropic activity where so much knowledge is to be gained at first hand regarding the needs of the very poorest of the inhabitants."

A Memorandum on the subject is attached as an appendix (C) to this Report.

Total Mortality.—In 1913 the number of deaths registered was 20,675 as against 20,132 in the previous year. The average for the previous five years was 20,771. The ratio of deaths calculated on the Census population of 1911 was 39. 9 per mille. The corresponding ratio for 1912 was 38. 8 per mille and the mean ratio of the previous five years was 400. The death rate calculated on the estimated population for 1913 was 39. 7. Graph IV shows the death-rates for the previous years.

Seasonal Incidence of Mortality.—The month of September showed a death rate nearly 50 per cent. less than that of December. From Graph I it will be seen that the two months after the heavy rainfall are the months of highest death rates. The increase is found to occur in all the main diseases, and no particular disease is responsible. The largest number of deaths occurred in December.

Age Incidence of Mortality.—A little less than half the total number of deaths occurred in the first five years of life and 103 males died to every 100 females.

Certified Deaths.—The number of deaths certified by qualified medical men was 2,225 or 16.8 per cent of the total number of deaths in the city. Of these 706 were certified by private medical practitioners and 1,519 by public hospitals.

Causes of General Mortality

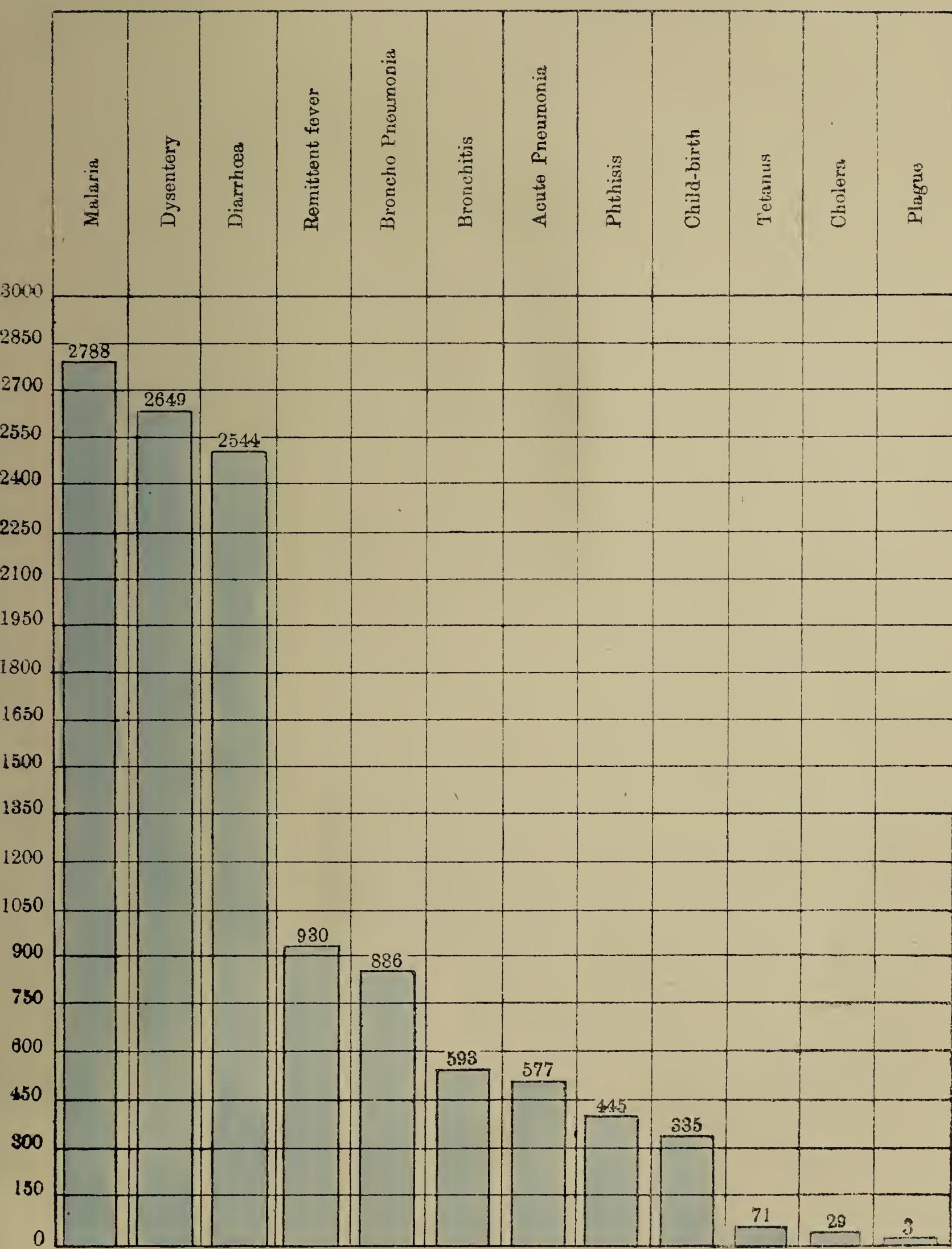
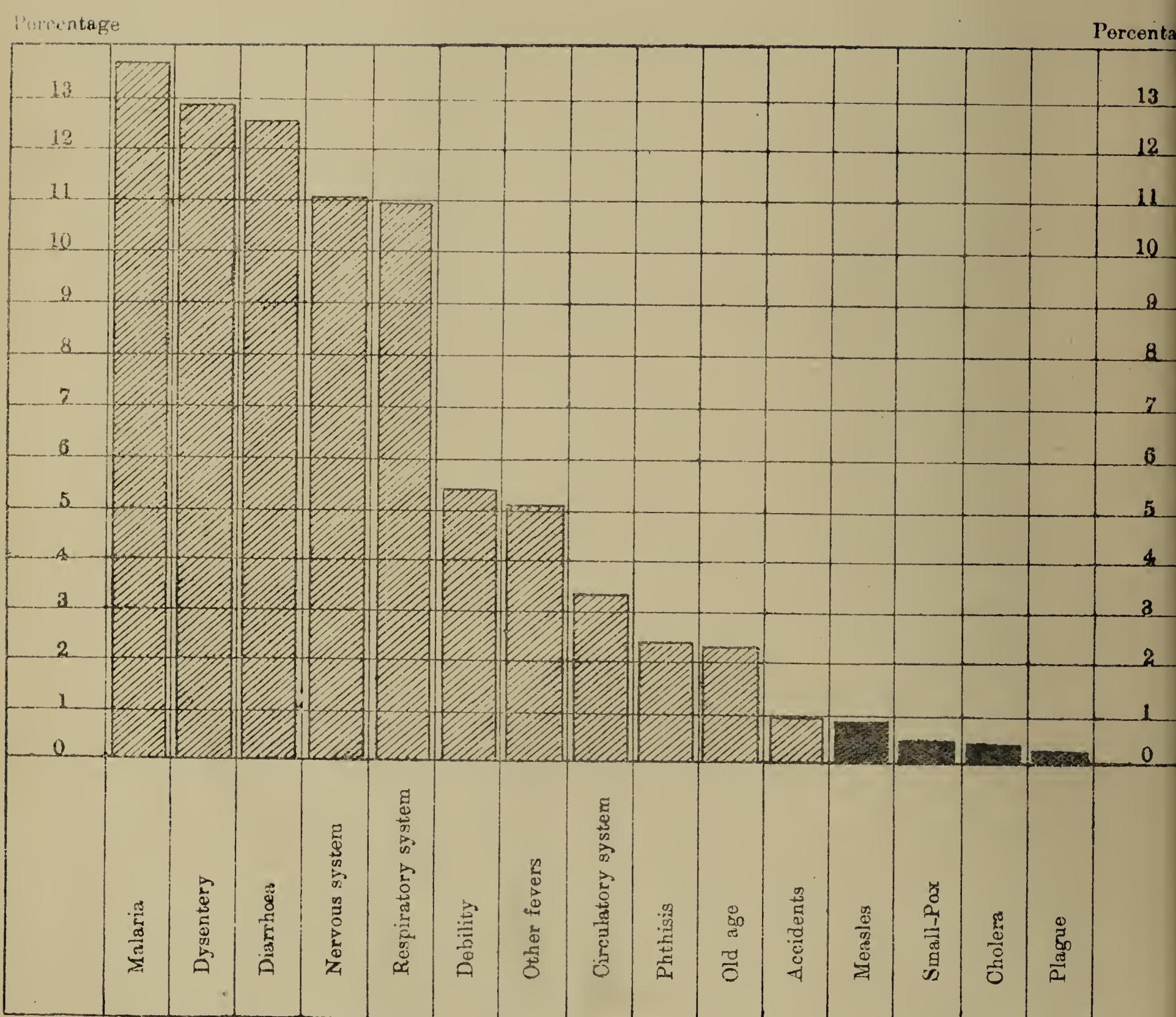


DIAGRAM No. III

Diagram showing
Percentages of deaths from Principal Causes to
the total Mortality of Madras in 1913.



Reg. No. 1033

Copies 362

Zinco, Survey Office, Madras
1914

Infectious

and other Diseases

Mortality by Divisions.—The three Tondiarpet divisions (See Graphs III and VI) show a death rate very considerably higher than that of the rest of the city, partly due, no doubt, to the prevalence of Malaria. It is the death rate of these divisions that has kept the figure for the whole city at about 40 per 1000, as comparison with the average rates for the previous five years shows that practically every other division in the city gives an appreciable decrease.

Mortality according to Class and Race.—The aggregate death-rates among Mohammedans was 44.1 per thousand, among Hindus 40.4 and among Christians 30.3. In the 20th (Mylapore) Division the death-rate among Mohammedans was as high as 96.3 per 1000, whilst in the 9th division the rate in that section of the community was 94.2. In both these divisions however the number of Mohammedans is comparatively small. The Christians of the 9th division showed a death-rate of 85.2 per 1000, figures which show how very unhealthy this division of Georgetown is.

Causes of Mortality: Malaria.—Diagram No. III shows graphically the chief causes of death. Malaria is responsible for the greatest number with 13.4 per cent of the total. Annual Form X (see Graph IX) shows that in Tondiarpet this disease existed in epidemic form, nearly 1,000 out of a total of 2,788 deaths occurring in this district. The 6th and 7th divisions of Georgetown closely abutting on Tondiarpet have also suffered to a considerable extent, this probably being due to the direct spread of infection from Tondiarpet. Purasawalkam (the 11th division) and Mylapore (the 19th division) also give high figures compared with the surrounding districts, and this coincides with the Special Malaria Officer's findings, as he demonstrated by examination of the inhabitants of these two divisions that they are centres of Malaria and the people are widely infected. Energetic steps in all three of these infected parts are being taken by a Malaria staff to reduce the incidence of this disease. When it is seen that the death-rate from Malaria in the Tondiarpet Divisions varies between 11.5 and 15.5 it may be better imagined than described what the morbidity rate must be. It is a well-known fact that until quite recently many of the houses were deserted and the people were driven from the district altogether. Since antimalarial work of a permanent character was begun it is gratifying to note that the houses are again being occupied and that the people no longer fear to return to their former residences.

Diarrhoea and Dysentery.—In order to make use of the figures, it is necessary to take these two headings together, and the number of deaths registered under them was 5,193. This represents a death rate of 10.0 per 1000 from bowel disease alone. (See Graphs I and VII). The mean ratio for the previous five years was 8.2, therefore the Special Engineer's remarks in his water report regarding the steady increase of the death rate have been again proved correct. This year's figures are the highest on record, and there has been a steady increase in these intestinal diseases since 1910. Of the 5,193, 1,551 occurred amongst infants under one year of age. The percentage in general mortality from these intestinal diseases closely approaches this figure and seems to point to some common cause. There is no doubt that bad drainage and the defective water supply, necessitating the use of infected and polluted wells, are two common causes, and it is believed that when these are improved the mortality both amongst adults and infants will steadily decrease. The months of December, January and February were, as usual, those showing the highest rates.

Annual Form XII gives figures showing the local variations in the mortality from these intestinal diseases, while Graph VII shows a comparison with 1912 in this respect. The three Tondiarpet divisions again maintain their unenviable notoriety, and Purasawalkam and Perambur give even comparatively higher rates. In the six divisions of Georgetown on the other hand which have a fairly efficient and good water supply, and are the only parts of the city where there is a fairly good gradient for drainage, the rates for these intestinal diseases are less than half of those of the divisions already mentioned. This relationship of bowel

disease to the condition of the water supply may be traced throughout the city. Graph VII demonstrates in very striking fashion the tremendous difference in the death rates in different divisions, and also shows clearly that overcrowding, congestion &c., can have little effect in producing these diseases ; for the most congested districts, viz., the 4th to 9th divisions and 16th to 18th divisions show the lowest rates. Now that a scheme for supplying piped filtered water all over Madras is nearly complete, it is not too much to hope that in the near future the death rate from intestinal diseases will gradually, but steadily, decrease.

Diseases of nervous system.—Of the 2,283 deaths registered under this heading, 1,574 were those of children under one year of age, who presumably died in convulsions. This has been previously discussed. Of the remaining 709 cases, 58 deaths were registered as due to puerperal eclampsia giving a death rate from this disease of 0.2 per mille of the female population.

Hemiplegia accounted for 217 deaths and Tetanus for 71. It is of interest to note that while 49 deaths are said to have been due to Meningitis, there is no mention of deaths from Cerebro-Spinal Meningitis. It is very apparent that these figures are most unreliable, and it is doubtful whether any useful end would be met by attempting to draw any conclusion therefrom.

General Respiratory Diseases.—The death rate from Respiratory diseases excluding Tubercle of the Lung was 4.2 as compared with an average rate of 3.2 for the previous five years. The monthly incidence shows no great fluctuation, and the chill of the rainy season seems to produce little increase in these affections. The Indian readily falls a victim to the pneumococcal attack whatever the temperature or season, as witness the fact that there were 1,463 deaths from pneumonia during the year. At the same time it is worthy of note that the overcrowded and congested areas of Georgetown, Triplicane and Mylapore, gave rates very considerably higher than those of sparsely populated areas ; and the problem of congestion assumes greater importance in relation to these diseases than to any already mentioned.

Tubercle including Tuberculosis of the Lung.—481 deaths were registered as due to Tubercle, 445 of these being registered under Tuberculosis of the Lung. This gives a death rate of 0.9 per 1000 which may not seem worthy of further remark. It must be remembered, however, that the deaths registered under Bronchitis are 583 in number, and it is practically certain that a considerable proportion of these are really due to Tubercle. The death rate from Tuberculosis also has steadily risen since 1910 from 0.4 to its present figure, and when these two facts are taken into account it will perhaps be admitted that the time is ripe for the initiation of a campaign against this dread disease. It is needless to assert again that the prevention of overcrowding and the relief of congested areas are two steps of the utmost importance, except merely to demonstrate this fact from the statistics for the year. In the 9th division of Georgetown, perhaps one of the most congested areas in Madras the rate was as high as 2.5 per 1000. Compulsory notification has been recently recommended to the Corporation in a memorandum on the subject which may be found in Appendix B to this report.

Infectious Diseases.—During 1913 the city was remarkably free from infectious diseases. 136 attacks and 34 deaths from Small-pox occurred during 1913. There was nothing in the nature of an epidemic however. 3 deaths from Plague—all imported cases—were registered but in two only was the Plague Bacillus found. In the early months of the year a sharp epidemic of measles occurred in Tondiarpet (1st & 2nd divisions) this accounting for 86 cases out of a total of 157, but a few cases occurred here and there in the city throughout the year.

The figures for Enteric Fever show a total of 37 deaths, but it is doubtful whether this is anything like a correct estimate of the deaths from that disease.

Out of 47 cases of Cholera, 29 terminated fatally. During April, June, October and December, no cases occurred, and in no month did the deaths number more than seven. There was obviously nothing in the nature of an epidemic.

Infectious Diseases Hospitals.—The Corporation maintains two infectious diseases hospitals, viz., the Isolation Hospital at Krishnampet and the Plague Hospital, Egmore. The former is in charge of a Sub-Assistant Surgeon, under the administrative control and supervision of the Surgeon, 4th District, while the latter is supervised by the Civil Assistant Surgeon of the 3rd District in direct subordination to the Health Officer.

The inadequacy of the provision for satisfactory treatment of cases of infectious diseases has been long felt, and were a severe epidemic to occur, it would be difficult to know how any attempt at isolation could be made. Plans for a large modern hospital sufficient to meet the requirements of the city have been made, but have not yet been finally sanctioned by Government.

Restraint of Infection.—During the year 10 jars of Mercury Perchloride, 238 gallons of Cyllin and 10 jars of Carbolic Acid were issued for purposes of disinfection of huts, houses, latrines, etc., 62 lbs. of Potassium Permanganate were also issued for disinfection of wells. All disinfections are carried out under the direct supervision of the Sanitary Inspectors.

Leaflets in the vernaculars on "Flies" and "Hints for prevention of Cholera," were distributed broadcast among the public and an extension of this method of spreading information regarding hygiene and public health is desirable.

Diabetes.—As the question of the cause of the high incidence of this disease in Madras Presidency has been raised recently, it may be of interest to note the records of deaths for 1912 and 1913 from this disease and its complications.

	1912	1913
Diabetes ...	51	27
Diabetic Carbuncle ...	28	72
" Coma ...	2	2
" Gangrene	11	22
	—	—
	92	123
	—	—

Kala Azar.—37 deaths were registered as due to Kala Azar. The corresponding numbers for 1912 and 1911 were 36 and 47 respectively.

Influences of Density of Population on the Death Rate.—The statement by News-holme that density *per se* and a high mortality have little or no connection, is amply corroborated in Madras City, as may be seen from Graph VI. The true index of density is the number of persons per occupied room. In the graph, the total mortality curve and the density of population curve show absolutely no relationship, but observation shows that overcrowding in houses co-exists with a high mortality, *e.g.*, the 11th (Purasawakkam) and the 18th (Triplicane) divisions. Much remains to be done in the way of driving broad streets through the crowded and congested localities in these and in other divisions, and in building Model Paracherries on the lines of those in Broadway and Cemetery Road. Unlike the other presidency towns of India, in Madras City there is no lack of vacant land, and so long as private enterprise does not exist, it must remain a duty of the Corporation to gradually extend the building of model dwellings for the poorer classes of the community.

Influence of sex on mortality.—The death rate amongst women is usually lower than amongst men, but the yearly death-rate in 1913 was, for males 39.3. and for females 40.3.

From Annual Form No. IV some interesting facts are to be deduced. Of the deaths of those under one year of age, 3014 were males, 2699 females. This is partly explained by the fact that for every 100 females born there were 104.1 males, and that male children, being usually larger, are more liable to injury while passing through the pelvic canal.

Up to the age-period "15 and under 20 years", the male deaths preponderate, but during this period and the next "20 and under 30 years" the death rate amongst females is much higher. Early marriages and child-bearing account probably wholly for the high death rate.

After these two periods, the most dangerous in a woman's life, the male deaths again preponderate, until at the 12th period "60 years and over", the female deaths, as might be expected, again show an excess over male deaths.

Influence of season—This had been already remarked upon under various headings. From Annual Form No. III it is seen that January, February and December, the months succeeding the heavy monsoon rains showed much the highest death rates, the healthiest months in the year being September and October. The tables giving monthly totals for single diseases or group of diseases show the same seasonal incidence, and the conclusion therefore is that the heavy rain-fall produces or enhances general unhealthy conditions throughout the city. (See Graph I)

Prosecutions.—During the year under review, seven prosecutions were instituted for failing to report deaths within the time allowed by the Act. Convictions were obtained in six cases and in one case the party was warned. The fines imposed amounted to Rs. 5-8-0.

Burial & Burning Grounds.—One Christian, one Mohammedan and eight Hindu Burial Grounds in the city belong to, and are under the direct control of, the Corporation. Peons are attached to all burial grounds in the city. They take down particulars regarding all bodies brought for burial and warn the friends to have the deaths registered in the divisional Registration Offices. The information thus collected is entered on a printed form and these forms are forwarded daily to the Health Office from whence they are distributed to the Divisional Registrars concerned for final disposal.

During the year a representation from the Buddhist community residing in Madras was received and a plot of land in Mylapore Burial Ground was set apart for their exclusive use.

APPENDIX A.

The milk supply of Madras.

Sources of Supply. There are three main sources of supply. Milk for domestic use is generally derived from cows kept in the city itself. Milk for consumption in Boarding Houses, Restaurants and Coffee Hotels, as well as that used for making butter, sweets and curd, is sent in from the neighbouring villages. This supply is either buffaloes' milk or a mixture of buffaloes', goats' and sheep's milk, but milk in the form of curd is also supplied to the city from a number of these villages. The third source is tinned milk which is imported in large quantities.

There are 17 so-called dairies in the city, but only two of these *viz.*, the Fort dairy which retails 70 measures a day, and Mr. Bullmore's, Mount Road, which retails 90 measures a day, really deserve the name. The other institutions do not supply whole milk to consumers, but convert all milk received, into butter, selling only the separated milk. Doubtless these establishments produce large quantities of butter of a good quality, and this is of benefit so far as the interests of a small section of the population are concerned; but, on the other hand, they abstract a large quantity of the existing supply of whole milk, and in return put on the market a large quantity of separated milk, very poor in fats and practically useless as a food either to children or adults.

These creameries are not likely to develop into regular dairies as the proprietors are not able to find capital to invest in herds of cows, and, in any case, the butter trade is a more lucrative one and gives a more rapid return on their outlay. However, they are a step in the right direction and ought to be encouraged, although their sanitary condition might be considerably improved if they were brought under effective Corporation control.

Enquiry has shown that the present supply of milk does not depend on proprietors of large herds of cattle but is entirely in the hands of petty owners; according to the returns there are 531 licensed milch cattle-keepers in the city. Of these, one keeps 50 and another 33 animals; of the rest, 9 persons maintain 20-30 cattle each; 111 persons 10-20 cattle each; 275 persons 5 to 10 cattle each, and 134 persons less than 5 cattle each. Many of these animals are buffaloes, the numbers of cows and buffaloes for the whole city being 1248 and 2339 respectively. It will be seen, therefore, that the greatest bulk of the visible supply of milk for the city is in the hands of men who have neither the means nor the desire to aim at anything beyond immediate profit.

2. *The house and feeding of milch cattle.* The condition of the cattle-sheds is generally unsatisfactory in every way; construction, entire space, ventilation and sanitation, leaving much to be desired. Many of the cow-houses are indeed simply thatched roofs propped up against the external walls of dwelling houses, or walls of courtyards. Where the structural conditions are better, it has been found that cattle are occupying parts of human dwelling houses, a distinct contravention of the conditions of the license. Over-crowding is a feature very commonly met with, and with low roofs and no open court-yard, the entire space is very considerably below what it ought to be. A free circulation and a proper supply of fresh air cannot be obtained even although the shed is open on one side, as the cow-houses are usually surrounded by high dwelling-houses.

According to the conditions laid down when a license is granted, all cattle yards should be paved with asphalt or granite or bricks jointed with cement. The floors of many cattle yards are flagged and sloped towards drains, but they are nearly all badly jointed and loosely laid. Liquid lodges in every joint and percolates through, and, as the floors are never properly cleaned, liquid filth oozes out continuously. The drains are kept full of

dung, as storage pits are rarely met with, or the dung is heaped up in one corner of the shed. Where there is no paving, the conditions of the floor are still worse. The walls of the sheds and of the cattle-yards are in every case plastered with cow-dung cakes and under these circumstances the effect of whitewashing disappears in a day or two. Bedding is never provided for the animals, and, when they lie down dung and mud stick to their flanks, udders and teats. The cattle are not washed, and udders and teats not cleaned before milking. In a few instances there are water-taps in the yards, but in most cases water has to be brought from taps in the houses or from the street. This water-supply is rarely put to a legitimate use, most frequently being used to adulterate the milk.

The feeding of milch cattle is more or less uniform. Straw, gingelly cakes, husks of dhol, rice or wheat bran and cotton seeds are the main constituents of diet, while in a few cases linseed-oil cakes are given with a view to increase the flow of milk. The animals usually drink rice water or ordinary tap water. While these articles of diet are good enough in themselves, they very frequently are not clean by the time they are given to the cattle. Straw is commonly stored in corners of the yard itself, while other articles are kept in the milkman's own house. Poorer cattle owners frequently allow their animals to wander about the streets at night to feed on the contents of the dust-bins or to pick up the refuse of the gutter. The calves are much neglected and even starved to death, the question of immediate profit from the milk of the mothers obliterating from the owner's mind the question of future profit from the sale of sturdy calves.

3. *Conditions obtaining in the City as regards Storage and distribution of milk.* Milk is, as a rule, not stored in large quantities for any length of time, as there are no regular milk-shops in the city. Most household and hospital supplies are drawn from the cows in the presence of the consumers or their representatives, and handed over forthwith. Other supplies are brought from the cattle sheds by the milkmen soon after the cattle are milked. The milk brought to the dairies or creameries is at once put into the separators, and the separated milk either returned to the suppliers or sold to customers. Only in the case of milk used for the manufacture of curd does anything like storage take place. For this purpose it is soured and kept in earthen pots, usually dirty, either in kitchens or living rooms in like condition. The chances of contamination do not lie so much in storage as in the kind and condition of vessels used, and in the adulteration to which the milk is subjected during distribution. The milk is drawn from cows with dirty teats and udders by unwashed hands into cans and brass vessels which also add their quota of filth. During distribution these tin and brass vessels may or may not be covered but, if they are, pieces of dirty cloth or some small loosely fitting cover is used. Street hawkers of milk and curd measure out the "fluid" to the purchaser by means of a cocoanut shell dipped into it along with the fingers of the vendor. The milk vessels are certainly never scalded with hot water, but are scoured with ashes or a handful of earth and water, or simply rinsed with pipe water, and that too at very irregular periods. Earthen pots may be brushed with straw or cocoanut fibre and washed with water.

4. *The extent to which the supply comes from the mofussil areas.* Enquiry has shown that from 500—700 measures of milk are sent into the city from the neighbouring villages. From the same villages a large quantity of curd, amounting to about 1,400 measures a day is also supplied. Both these supplies are brought into the city in carts or by hand. If brought in by rail, the vessels are deposited on the floor of a passenger carriage and not in the van. All the unsatisfactory conditions detailed above with respect to cow-houses, milkmen etc., in the city are found even more intense in these mofussil villages. Sanitary principles are not even of the most primitive character, and the milk and curd must be grossly contaminated by the time it reaches the consumer.

5. *Tinned milk and the Extent of its Usage.* According to the information furnished by the Custom House authorities, 7,20,181 lbs. of condensed milk valued at Rs. 2,92,920

were landed in the Madras Port during the year 1912-13. This excludes milk foods such as Horlick's Malted Milk, Nestle's Milk, Mellin's Food, etc., which are consigned under the name "Farinaceous Food" along with sago and similar articles.

Attempts to discover how much of the above quantity of condensed milk was sold for consumption within the city have failed.

Much of the Condensed Milk sold for consumption within the city is used for infant feeding by the middle and especially by the lower classes. But it is to be noted that the imported Condensed Milk is of two kinds (a) Condensed whole or full cream milk (b) Condensed skimmed or separated milk. The Nestle and Anglo-Swiss Condensed Milk Co., in two letters, have given approximate estimates of both varieties and it would seem that while the imports of full cream condensed milk are diminishing, those of skimmed condensed milk are rapidly rising. The full cream condensed milk contains according to analyses made at the King Institute, Guindy, 11.525 per cent. of fat, so that this variety may be considered a reliable milk and quite suitable as a food for infants. The condensed skimmed milk, on the other hand, is prepared from the waste products of butter and cheese factories and usually contains as little as 0.2 to 0.3 per cent. of fat, and consequently is without any value as a food. Attention has also been drawn to the fact that these brands of condensed skimmed milk are put up and exposed for sale in shops of an appearance similar to the tins in which the full cream condensed milk is packed. Although the labels differ, the general "get up" of the package is quite sufficient to deceive the uneducated people. All the Merchandise Trades Act demands is that the labels on the tins should bear the words "Prepared from skimmed Milk," but this is printed in such small type and is often so cunningly included among the other printed information on the label that the intimation might be easily overlooked. This condensed skimmed milk is usually sold not at a much reduced rate, as might be expected, but in many places five or six annas is charged for a tin as compared with seven annas for a full cream milk. The difference in price where the difference in quality is not properly understood is sufficient to explain the increasing sales of this inferior milk especially as the full cream condensed milk has been used for years by the people and is accepted as a good quality of milk for the rearing of infants. The increasing use of this condensed skimmed milk as food for infants constitutes a grave danger, and it is not difficult to conceive that many infantile deaths may be due to children being fed on this valueless article of diet.

In some of the colonies e.g., Hong Kong, etc., special ordinances were passed to amend "The Sale of Food and Drugs Ordinance" whereby provision was made to prevent skimmed condensed milk being used for children under one year old. Some such provision in the Madras Act is necessary, e.g., as follows :—

Every tin or other receptacle containing condensed, separated or skimmed milk sold or exposed for sale or consumption in the city shall bear a label; and on every such label and on the wrapper, if any, of every such tin or other receptacle there shall be printed in large and legible type in English, Tamil, Telugu, and Hindustani, the words "This is skimmed milk. Children under one year of age should not be fed on it," and no person shall sell or expose or offer for sale for consumption in the city condensed, separated, or skimmed milk in contravention of this section.

No person shall import into the city of Madras condensed, separated or skimmed milk, except in tins or other receptacles which bear a label whereon the words "this is skimmed milk. Children under one year of age should not be fed on it" are printed in large and legible type in English and in the vernacular languages prevailing in the city.

6. *Preventive Adulteration.* We proceed to consider the extent to which the practice of having cows brought to the house of the consumer to be milked in the presence of some member of the household as a preventive of adulteration obtains in the city.

A large percentage of the cows in the city are brought to the houses of the consumers to be milked in their presence. Even then, however, the closest supervision is necessary, and it seems to be doubtful whether this custom prevents adulteration to any considerable extent.

The local dealers in milk adulterate it with pipe-water, while the dealers from the surrounding villages, where of course no supervision can be made, use tank water, well water or water from any other convenient source. The hawkers who purchase skimmed or separated milk from the dairies add to it buffaloe milk while it is said that some Coffee Hotel keepers add cunjee water to skimmed milk in order to thicken it. Rice flour and sugar added to a very considerably watered milk will give it the appearance of a good milk to any casual observer.

7. *Boiling as a Safe-Guard against the Transmission of Disease.* The domestic supply of milk is generally heated to a fairly high temperature, but whether it is really brought to the boiling point is somewhat doubtful. Milk consumed in Coffee Hotels and similar institutions, and that hawked on railway station platforms and in the streets, is usually sold a little hot, but here also it is difficult to believe that the milk is ever really boiled.

8. *Municipal Control.* The extent to which the Corporation has found it possible to exercise effective control over, and to enforce sanitary principles in regard to these matters under the provisions of the Municipal Act, 1904 has next to be considered.

Under Section 314, places where horses, cattle, goats, and sheep are kept, must be licensed, these licenses being granted on certain conditions which are laid down in bye-laws 178—181. Under bye-laws 182-188 conditions are laid down for the regulating of the water-supply, lighting, ventilation, cubic space, drainage and sanitation of dairies and cattle sheds in the occupation of persons following the trade of dairymen or milk sellers and licensed under section 314, and these conditions are also printed in detail on the back of all licenses issued by the Corporation.

It has been found impossible in practice to rigidly enforce these bye-laws and their conditions. Most of the owners of milk cattle are poor, and are unable either to purchase or rent large plots for dairy sites or buildings suitable for dairies or cattle-sheds. Nor are they usually in a position to spend comparatively large sums on extensive structural alterations. Enforcement of the bye-laws under these circumstances would have merely rendered the milk cattle-owners homeless, and this would eventually have led to their giving up the trade altogether, and a great decrease in the visible supply of milk would have resulted. It has been customary, therefore, for the Corporation to issue to these cattle-dealers "provisional" licences, and under threat of being fined and having their licenses cancelled, minor repairs and works are from time to time done. Beyond this however, it has been impossible to go, and these bye-laws have been, and are, practically a dead letter. To bye-laws 189—192 (for securing cleanliness of milk-stores, milk-shops and milk-vessels) and bye-laws 193—201 (for prescribing precautions to be taken for protecting milch cattle and milk against infection and contamination), the same remarks apply with equal force. The effects of white-washing are soon nullified if cow-dung cakes are daily plastered over the walls, and, where cleanliness of the person is not deemed essential, it is hardly to be expected that clean milk-vessels and clean surroundings for storage of milk will be provided, nor can it be expected that ignorant uneducated milk-men will carry out the order in bye-law 197 where it is forbidden to keep or sell milk in any dwelling house, or room or place used for sleeping or cooking—when one finds quite commonly that the cows and buffaloes themselves are housed in these very places.

9. *Further Measures.* Further practical measures could be adopted, having regard to the varying conditions, to ensure a pure and satisfactory supply of milk without rendering it less abundant or more expensive.

(a) The following regulations in force in Scotland are necessary to enforce cleanliness both among milch cattle and milk-men and to prevent contamination or infection of milk, and might with advantage be incorporated in the bye-laws under Section 409 of the Act.

Regulations as to dairies, cow-sheds, byres and milkshops.

* * * *

19. The cows in every dairy shall be kept clean, and the flanks, udders and teats of the cows and hands of the milkers shall be properly cleansed before milking is commenced ; and the milk shall be at once filtered by passing it through a sieve so as to free it from all foreign matter, All milk shall be removed without delay from every cow-shed or byre, and no milk vessels shall be retained, stored or filled within the byre, other than those actually in use for the time being in milking the animals.”

20. “Every dairyman, purveyor of milk, or person selling milk by retail, shall cause all these employed or engaged in the business to keep their persons and clothing at all times in a thoroughly clean condition ; and shall adopt every known and reasonable precaution to provide against and prevent infection or contamination of the milk.”

* * * *

22. “No purveyor of milk, or person selling milk by retail, shall keep milk for sale in any alpe where it would be liable to become infected or contaminated by gases or effluvia arising from any sewer, drain, cesspool, or closet, or by any effluvia from putrid or offensive substances by impure air, or by any offensive or, deleterious gases or substances.”

23. “No purveyor of milk, or person selling milk by retail shall convey or carry or permit to be conveyed or carried through the milk store or milk-shop, any excrementitious or offensive matter or any soiled bed or body clothing.”

* * * *

25. “A purveyor of milk, or person selling milk by retail, shall not allow any milkstore milk-shop, dairy or other place, where milk is stored or exposed by him for sale to have internal communication by a door, window, room, passage, or otherwise with a dwelling room or sleeping apartment.

26. “No dairy, milkshop, or milk-store or any place connected or communicating therewith, shall contain any article or have any operation carried out therein which may tend to contaminate the milk.

27. “No purveyor of milk, or person selling milk by retail shall wash or scald, or keep any milk vessel or utensil in any byre, dwelling room, or sleeping apartment, or in any apartment used for mangling, or washing bed or body cloth, or in any boiler, tub, sink, or other receptacle which is used in such process ; and no purveyor or person selling milk by retail shall, in any apartment or adjoining apartment, where milk is exposed, or where milk vessels are washed or kept, mangle or wash, or permit any other person to mangle or wash any bed, or body cloth or hang up such clothing to dry therein.

28. “No milkshop or milk-store shall be in communication, directly or through any cow-shed with or any place where animals of any kind are kept.”

* * * *

34. “No infected article shall be taken into or through any part of a dairy, milk-shop, milkstore, or premises used in connection therewith.”

35. “No purveyor of milk or person selling milk by retail shall convey or permit to be conveyed by any cart or other vehicle used in the conveyance or distribution of milk either while so engaged or at any other time, any article or thing which is of such a nature as to be likely to contaminate the milk ”.

(b) All milk vendors, whether cattle keepers or not, should be registered with the Corporation. This will enable the Corporation to supervise by inspection all who are engaged in the trade, To enforce registration, bye-laws on the lines of the following provisions of “Theairies Cow-sheds and Milk-shops order of 1885” may be adopted.

The dairies, cow sheds and milkshops order of 1885.

6, (1) “Registration of Dairymen and others :—It shall not be lawful for any person to carry on in the district of any local authority the trade of cow-keeper, dairyman, or purveyor of milk, unless he is registered as such therein in accordance with this article.”

(2) “Every local authority shall keep a register of persons from time to time carrying on in their district the trade of cow-keepers, dairymen, or purveyors of milk, and shall from time to time revise and correct the register.”

(3) "The local authority shall register every such person, but the fact of such registration shall not be deemed to authorise such person to occupy as a dairy or cow-shed any particular building or in any way preclude any proceedings being taken against such person for non-compliance with, or infringement of any of the provisions of this order or any regulations made thereunder."

(4) "The local authority shall from time to time give public notice by advertisement in a newspaper circulating in their district and, if they think fit, by placards, handbills, or otherwise, of registration being required and of the mode of registration."

(c) The terms "Milk," "Dairy," "Dairyman," and "Cattle Shed," should be defined.

The expression "Milk" should be extended to include separated milk, skimmed milk, buttermilk, curd and all milk products, in order that all creameries and the places where curd is manufactured or sold, as well as curd-sellers, may be brought under the control of the Corporation.

The following definitions of the terms "Dairy," "Dairyman" and "Cattle shed" given in Section 6' (3) of the Public Health (Scotland) Act of 1897 and Section 1 of the Cattle sheds in Burghs (Scotland) Act of 1866 may be adopted.

"The word "Dairy" includes any farm, farm-house, cow-shed, milk-store, milk-shop or other place from which milk is supplied or in which milk is kept for purposes of sale. The word "Dairyman" includes any cow-keeper, purveyor of milk, or occupier of a dairy."

"The word "Cattle-shed" shall mean and include every house, building, shed, yard, other enclosed space or premises in which bulls, cows, heifers, oxen, or calves are kept or intended to be kept".

Note :--- Add "buffaloes" after the word "Oxen"

From what has been said, however, under clause 8, it is obvious that the mere drawing up and passing of additional bye-laws will be practically useless unless additional and more practical measures are taken to improve the present unsatisfactory state of affairs, and to replace an unwholesome and inefficient supply of milk with a wholesome and adequate one. As milk is one of the staple articles of diet of the people, and, as the Corporation are guardians of public health it is their paramount duty to see that it is produced under suitable conditions as to abundance and cleanliness. A very recent volume on "The Milk Question" by an American authority points out that both in England and America, the dirty cow-sheds, the uncleanly surroundings, the improper water supply and the small farmer who has no capital wherewith to improve the unsatisfactory conditions to which his attention may be drawn, are still extant. These conditions have been combated by no startling innovation, but by initiating the policy of co-operation on the part of the Dairy-farmers, and especially of those who have small farms. It is urged that by co-operation the work of sterilizing cans and other utensils, and of cooling, can be carried out much more economically and thoroughly than by a small farmer, who, as a rule, neglects them altogether. Such conditions are just those which have been shown to exist in Madras City and to introduce any such system as co-operation the Corporation must take the first step, and that on the following main lines:—

(a) The establishment of a large Dairy farm outside the precincts of the city where plenty of grazing could be had, for say, 1,000 milch cattle.

(b) The establishment of milk shops throughout the city where the milk sent in from the farm could be distributed and sold.

(c) The building of large model cow-houses in the city where numbers of milch cattle could be housed, owners of milch cows being able to rent stalls for a small sum per mensem, and in connection with these cow-houses separate buildings where all utensils used for collection and distribution of the milk could be cleansed, and were the milk itself could

be stored or cooled, the whole scheme being under the supervision and control of the Corporation.

With reference to (a) and (b) while the dairy farm and the milk-shops would have to be initiated by the Corporation, the intention should be, not for the Corporation to continue to act as purveyors of milk, but to gradually induce honest traders and capitalists to invest money and to eventually take over the whole scheme, the Corporation merely exercising control as regards sanitation, etc. The recommendations made by the Sub-Committee on the Dairying Industry of India at the recent All India Agricultural Conference, Coimbatore, may be adopted. The dairy farm might very well become a very suitable centre for cattle-breeding, and even after the Corporation had handed over the whole concern to private-traders a supply of well-bred bulls might be kept there, so that the best "milkers" might be obtained.

Mr. H. C. Sampson's Report on Cattle Survey introduces another factor, namely, the drain Madras City makes at present on milch cattle, chiefly heifers with their first calf, which are sold to the butchers immediately they become dry. "If these could be bought up when dry, taken care of and served by a good bull," this drain on the country for milch cows would be checked.

The whole scheme would, as Mr. Sampson states, interfere to some extent with private enterprise, but as has been already stated, the Corporation would only give the scheme a start and allow private individuals to carry it on.

The Sub-Committee of the Coimbatore Agricultural Conference also recommended that with a view to the spreading of information as to the best means of handling, storing, transporting and selling of milk, and the manufacture, packing, transit and sale of milk products, the following measures should be adopted :—

(a) The dissemination by practical demonstration of the most up-to-date and profitable method of pasteurising and sterilising milk, of transporting and distributing milk in suitable vessels, of the manufacture, storage, packing and transport of ghee, butter and cheese and the utilisation of separated milk and other by-products. It appears that in many of the milk producing districts where separators are used, the separated milk is thrown away.

(b) The education of public opinion in cities by means of the press as to the importance of a "clean" milk supply.

(c) The provision by Government of free information and assistance to any one willing to embark on a dairy enterprise of any sort. This should take the form of free plans and specifications for all classes of dairying buildings free specifications and advice as to the purchase and erection of plant, as to the correct system of keeping dairying accounts, and free information generally on all points connected with the establishment and working of a dairy enterprise in any direction, so that any one willing to invest money in the industry might be so guided as to ensure its organisation being planned in the best possible manner for profit making.

The Corporation Dairy farm and milk-shops would supply to all concerned the necessary information suggested above, and would be a model on which private individuals could base their own buildings.

The whole scheme would cost the Corporation a very large sum of money, but it is hoped that the Government would subsidise this co-operative effort initiated by the Corporation, as recommended by the Agricultural Conference Committee.

With reference to (c) it is suggested that the Corporation might require to build the first of these cow-houses in the city as a model, but it is probable that if Co-operative Societies were encouraged by subsidy or otherwise, others would be built on the same lines by private individuals.

In time it might be possible to rid the city altogether of small private cow-houses and to insist on all milch cows being kept in these model houses, directly supervised by Corporation Veterinary and Sanitary Inspectors.

In any case, the condition of existing cow-houses and dairies in the city is so bad that something will have to be done very soon. The rate of infantile mortality is appallingly high and the deaths are in a very large percentage of cases due to intestinal disorders. It is probable that this high infantile mortality is in great part due to bad feeding, and were the milk supply of the city made wholesome, there is little doubt that many young lives now lost would be saved.

At present there is no supervision over the dairies in the villages on the outskirts of the city which supply a considerable quantity of milk and curd daily, and before the Corporation could be certain that a wholesome supply of milk was being given to the city, these sources would have to be put under the control of some Sanitary authority. The only feasible way would be the appointment of Government Inspectors and this would necessitate the adoption of additional provisions similar to Sections 60 and 61 of the Public Health (Scotland) Act 1897, which control and prohibit if necessary the importation of the milk supplies from any village to which infection can be traced. Were Co-operative Societies for dairying to spring up in the moffusil later on, it might be possible to import milk into the city only from these Societies.

APPENDIX B.

The Notification of Tuberculosis.

All medical men now acknowledge that Pulmonary Tuberculosis is a "dangerous" disease, and that some system of "control" of cases is necessary. This "control" has been carried out in England and Scotland by notification, either compulsory, or voluntary in the first instance, and it is now generally agreed that a "compulsory" notification is the only really useful method. Under the voluntary system many doctors cannot obtain the patient's consent to notification, but the greatest fault in the system is the lack of interest or knowledge on the part of general practitioners. Whether further steps be taken or not, valuable information would be derived from this first step, as it would in a very short time show to what extent the disease existed in the city, regarding which no reliable statistics at present exist. It is directly to the interests of the whole community that the actual extent of the disease in the community should be known. But while Tuberculosis is a disease of an infectious nature, it is a peculiar disease in its mode of dissemination and the conditions of environment on which this depends, and, therefore, it cannot be held that the system already in force for combating other infectious diseases is sufficient for the campaign against Tuberculosis. The difficulties raised when notification of other infectious diseases is brought into force, *e. g.*, interference with the liberty of the individual citizen, etc., will in all probability be brought up again. The same objections were raised in relation to the Income-tax schedule and other Government enquiries; but these difficulties soon were found in practice to be insignificant, and as regards Tuberculosis they would certainly prove more insignificant "when compared with the vastness and gravity of the evil to be combated."

If Public Health measures are to be really useful, it is just as necessary to have an effective system of notification of Pulmonary Tuberculosis as of smallpox.

Dr. Phillip of Edinburgh says "the chief cause for delay, in Scotland at least, has " been the need for assurance that local authorities were able financially and otherwise to take such effective action after notification as the facts would justify." This, however, was previous to the existence of any precedent in the matter.

Where "Voluntary" notification was at first introduced, no encouragement was given to practitioners to co-operate in notification, and the previous "voluntary" notification has now been replaced by a "compulsory notification" in a great percentage of cases. In order to make compulsory notification as simple as possible for general practitioners and other medical men of the city, the system in force in England and in Bombay and Calcutta may be adopted. Books of printed forms of notification, with stamped envelopes addressed to the Medical Officer of Health, are supplied free to all medical men, and all cases of pulmonary tuberculosis are in the first place notified to the Medical Officer of Health. The cordial co-operation of medical practitioners in the city with the Health Department is essential if any progress is to be made in the campaign. (The form suggested is appended). If the system of compulsory notification is to be adopted in Madras and the maximum advantage desired, then it is recommended that the Corporation sanction the proposal to pay a fee of Re. 1 for each verified case of pulmonary tuberculosis notified by practitioners to the Health Department. If this proposal be vetoed, the Corporation will find (as have various other local bodies) that the full advantages of compulsory notification will not be realised, and it is probable also that the various medical associations would take the matter up and oppose any such plan. But what is to follow notification? Notification of tuberculosis does not imply the removal of every notified case to a hospital or other institution, or segregation of all cases, as cases of other acute infectious diseases are segre-

gated, nor does it in itself effect the extermination of the disease ; and therefore, it may be suggested that the expense incurred in the system is unjustifiable. But those who look at the question simply from these two points of view do not grasp the situation.

Where the disease is in a very early stage, no special measures need be taken. Where the disease is in a late stage, the removal of the patient to a hospital will be sufficient, and it is probable that the families of most cases of this kind would be willing to permit this. But in many other cases, the notification of one case may lead to the discovery of a whole nest of disease, for the Edinburgh campaign has shown that tuberculosis is a house disease in many instances. It is in such instances where, as a result of notification of one case, several members of the same household are found to be infected, that the value of notification is best demonstrated. Many cases, at too early a stage to feel the necessity for taking medical advice, and at a sufficiently early stage to be treated successfully, are discovered thus.

Notification is an important factor in any scheme, because it directs the attention of the Medical Officer of Health to the sources of infection. Articles viii and ix of the Tuberculosis Regulations (1911) make the Medical Officer of Health the chief administrative officer. It is by him personally, or by an officer acting under his direction, that steps must be taken to prevent the spread of infection and remove conditions favourable thereto. The first of these steps is disinfection, immediate and periodic, of the house or rooms occupied by the patient ; and this can be carried out by Sanitary Inspectors.

Tubercle Bacilli have been found on the walls and floor of a room occupied by a tuberculous patient, and in the light of this knowledge it is incumbent on the Medical Officer of Health to stamp out as far as possible this source of infection. Under a system of compulsory notification, powers to disinfect tuberculous houses &c., without the patient's consent, should be obtained, similar to the powers specified in sections 46, 47, and 48 of the Public Health (Scotland) Act, 1897. As pulmonary tuberculosis is not included in the Act as a dangerous disease, the Health Department has no power at present to carry out disinfection in tuberculous houses. It might be said that without compulsory notification, the Sanitary Inspectors could explain the nature of the disease and the need for disinfection, and that little opposition would be raised, but this does not coincide with the experience of Inspectors whilst carrying out disinfection for other diseases. Under a voluntary notification scheme, if the occupier of the house objected to disinfection, nothing could be done, and as it is impossible for the Health Department to be cognisant of all changes of tenancy of infected houses, it is very probable that they might be vacated and re-occupied before the sanitary authorities were made aware of the chance of carrying out disinfection.

Disinfection should be carried out as follows :—

- (1) On receipt of notification, the rooms occupied by the patient, all bedding used by the patient which is likely to be used by other members of the household, and the work-place of the patient.
- (2) At frequent intervals if the patient continues to live at home, all rooms used by him should again be disinfected.
- (3) On removal of the patient either to a hospital or to a Sanatorium, the house, bedding, clothing and all utensils used by the patient should be disinfected.
- (4) On removal of the patient to another house, the vacated house should be thoroughly disinfected before it is re-occupied.
- (5) On death of patient.

The Municipal Sanitary staff would be available for the proper carrying out of all these disinfections.

In addition to disinfection of infected houses, the Medical Officer of Health should cause periodic disinfections to be carried out in places which may be factors in spreading infection. Particular attention in this respect should be paid to churches, theatres, public halls, schools, railway stations, tramcars, railway carriages, &c.

Notification raises a large number of questions as to the methods to be adopted with these varying elements at this focus of infection, as they require different lines of action. This leads up to the consideration of the complete scheme of organised and co-ordinated operations against tuberculosis, for "the key to complete success in the campaign against consumption lies in the harmonious co-ordination of well directed measures."

In addition to compulsory notification and disinfection, these measures include:—

- (1) A Tuberculosis Dispensary.
- (2) A Hospital or Wards for advanced Tuberculosis cases.
- (3) A Sanatorium or Farm Colony.
- (4) Supervision of milk and food supplies.
- (5) Education of the people, both adults and children.

The value of the Tuberculosis Dispensary has been established in several European countries, and no further pleading in favour of such an institution seems to be necessary. But from the start, it is to be remembered that it should form a well defined department of public health activity under the direction of the Medical Officer of Health. Article IX of the Tuberculosis Regulations 1911, defines the duties of Councils and Corporations. They are required not only to make arrangements for the examination of sputa but also for the appointment of clinical experts to assist the general practitioner in his diagnosis. They also are required to make arrangements for inquiry into each case not only as regards the patient himself but as regards the health of each member of the family and their intimates, whether fellow workers or friends. This reveals the contacts who should be clinically examined. For this work a doctor with an intimate knowledge of the disease in every aspect should be employed. The Dispensary also must be closely linked up with the other anti-tuberculosis agencies enumerated above, and not only with those agencies managed by State Departments and Hospitals but with as many societies of voluntary workers as is possible, e.g., the Social Service League or Sons of India Society. Later routine enquiry as to health of patients and contacts is best carried out by Sanitary Inspectors, Dispensary Nurses or health visitors of a Voluntary Workers' League. The members of the Managing Committee should certainly include, in addition to the Medical Officer of Health, Secretaries of these societies and other Voluntary workers, so that co-ordination may be as great as possible. Material relief might be wholly left to the members of these Voluntary Workers' societies. This relief is very often urgently required especially where the bread-winner of a family is disabled. This Dispensary, on the one hand, is the chief source of information of all kinds regarding tuberculosis, e.g., notifications, statistics, house and street incidence &c., and on the other hand the Health Department of the City helps the dispensary by supplying staff and materials for disinfection of houses, removal of patients &c., and also the same department, through the Sanitary Inspector staff, is able to send suspected contacts to the dispensary to be examined.

The staff of the dispensary would therefore include both paid and voluntary workers. The paid staff should consist of:—

1. One or more Medical Officers (one at least full time).
2. One or more Nurses.
3. A clerk or other subordinate worker.

The Medical Officers examine and treat patients at the dispensaries, examine sputa &c., and visit the patients in their houses, giving advice as to prophylaxis and at the same time keeping a sharp look out for "contact" cases. They would be in constant communication with the Health Department in connection with notification, disinfection of houses, &c. They would gather statistics from the available information and would train the voluntary workers in the work they would be expected to carry out.

The Nurse would visit the patients in their homes as soon after they have visited the dispensary as possible, making enquires as to conditions of life, sanitation, environment &c., while giving advice as to how best to carry out the Medical Officer's instructions and treatment, and how to avoid or minimise risk of infection. They would continue to revisit as many of these patients as possible, and repeat advice and instructions where such were not being followed or obeyed.

The Voluntary staff should be employed as health visitors. They would visit cases as directed by the Medical Officer, reporting to him after each visit. In Europe this staff is wholly composed of ladies, but while the Social Service League includes several Indian Ladies in its membership, most of the workers in Madras would necessarily be males, and it is understood that quite a large number is available. The Medical Officer would give lists of patients to be visited, to the Secretary of the League, who would then depute members to periodically visit, to try to gain the confidence of the people, to encourage and advise both patients and their friends and to report progress to the Secretary from time to time. The giving of material assistance e.g., in the way of supplying food, milk &c., may well be wholly left to the members of the Voluntary Workers' League. As already mentioned these workers would require some elementary knowledge of the methods of hygienic life, and the general methods of prevention, and this would be given by the Medical Officer of the Dispensary in the form of lectures &c. Especially would instruction have to be given in the care and feeding of infants and young children, as abundant opportunities would arise to spread this knowledge, and abundant need for such dissemination most surely exists. These voluntary workers would enormously relieve and help the work of the paid staff.

The cost of the Tuberculosis Dispensary depends on :—

- (1.) Total population of the city.
- (2.) Density of population.
- (3.) Death rate from tuberculosis.
- (4.) The amount of voluntary work and assistance which can be obtained.

A great part of the recurring expenditure would go towards salaries of the staff, but this could be considerably reduced if voluntary workers could be secured to replace paid Nurses. The Medical staff on the other hand cannot be given such unpaid assistance, as the Medical Officers should be men who are specialists, and one at least should give his whole time to the work. The best work could not be got from honorary physicians or part time medical Officers, as "one good visit from the right sort of person is worth six indifferent 'calls by one whose heart is not in the work and who holds the appointment merely as a 'means of earning money."

Compulsory notification plus a Tuberculosis Dispensary will early reveal the following facts :—

(a) The proportion of cases notified by the dispensary to the total number notified is increasingly large, as the dispensary becomes more and more the centre of the campaign against tuberculosis.

(b) The annual proportion of cases notified during life to the number of deaths also increases—showing that the dispensary is getting hold of an increasingly large percentage of the tuberculous material.

(e) The duration of the disease taken as the average time elapsing between notification and death of the patient becomes longer and longer—showing that the dispensary is discovering an increasingly large percentage of cases in the early stages.

Much has been written in the past few years on the results obtained with "tuberculin." No hesitation need be made in saying that the value of tuberculin as a therapeutic agent is not yet established, and the promiscuous administration of tuberculin by general practitioners who have no real knowledge either of the disease itself, or of the nature of the poison they are injecting or of the conditions which result from the injections, is much to be deprecated. The strictest clinical observation of the patient is essential where tuberculin is being used, and it is only an expert who can give the proper significance to the reactionary phenomena to be observed.

The Tuberculosis Dispensary must, on no account, be considered a "Tuberculin" Dispensary. The routine treatment of tuberculous patients with injections of tuberculin, while attending the out-patient department of the dispensary, will certainly lead to the institution falling into disfavour, and if a course of tuberculin is thought advisable, the case should be admitted either to a hospital ward or to the sanatorium where he can be watched both day and night, and where every symptom or sign can be noted and written down. It should be realised, once and for all, that tuberculin is an active poison, and that only harm can result from injections of such a poison where supervision is not made a "*Sine qua non*." The idea of a tuberculin dispensary, as against a "tuberculosis" dispensary has already spread among a certain section of the population, and this idea should be counteracted at every step and met with most strenuous opposition, until the value of tuberculin as a curative agent has been made certain.

The second measure in the campaign against tuberculosis is the provision of a hospital or hospital wards for advanced Tuberculous cases.

This hospital accommodation for the prevention of the spread of tuberculosis is an urgent necessity if notification is to have its full value. If the sanitary authority erects hospitals for isolation of cases of diphtheria and scarlet fever, it has an equal urgent duty to maintain a hospital for isolation of advanced cases of pulmonary tuberculosis. Tuberculosis is largely a disease of the poorer classes of the community and the danger of the spread of this infectious disease is proportionately greater to the limitations of house accommodation. The lowered earning capacity of individuals is also an important factor, for in addition to the tuberculous members of a family being a source of infection to the other members, they are a burden on them, in as much as they are unable to earn a livelihood. If no action be taken, the disease inevitably spreads, and other members of the household fall victims. The Municipal hospital would receive late cases, but to avoid patients and their friends looking on the institutions as a "home for the dying," the equipment and accommodation should correspond to those of an up to date sanatorium for the care and cure of patients suffering from the disease. The success of such a hospital in the campaign would depend on the proportion of cases which were retained during the last few months of life, but even when patients remained only for a limited period, their education as regards prevention and methods of hygienic living would have been at least commenced, and the exercise of precautions instilled into them there, would make them comparatively harmless inmates in their homes.

Careful consideration would be required as to whether such a hospital would be a success in Madras, where the people generally prefer to remove dying friends from hospital to their homes, but there is no doubt that it is an important factor in any anti-tuberculosis scheme.

The third measure is the Sanatorium or Farm Colony for early cases. This institution would treat only those cases whose physical condition was such as

warranted the hope that benefit would be derived from a course of treatment. The Dispensary Medical Officer would sort out suitable cases and at the sanatorium the patient would undergo not only treatment, but an education in the methods of living a healthy hygienic life, and in the methods of minimising the chance of spreading infection from himself to others. The sanatorium must provide the maximum of fresh air and sunlight, its surroundings must be as perfect from a hygienic point of view as possible, and it need not be expensive as regards type of construction, etc. The site chosen must be in a healthy locality and if possible at a certain altitude from the sea level, but persons suffering from tuberculosis should not be treated under artificial conditions if they are once more to take their place in the ranks of workers, and it has been proved that institutions built on the outskirts of the city from which they draw their patients, give as good results as those whose site has been specially chosen with regard to hygienic and climatic conditions. It is not proposed in this brief memorandum to go into details with regard to cost, type, component parts, arrangement or construction of a sanatorium. While in any scheme for the combating of this disease, a sanatorium is a component part, and with the others makes a co-ordinated whole, it is to be remembered that at the recent Sanitary Conference at Lucknow it was stated that effecting improvements of dwellings for the poor was perhaps a more urgent necessity.

The supervision of milk and food supplies, the fourth measure indicated in a complete anti-tuberculosis campaign has been dealt with in a separate memorandum as regards milk, and the Corporation has already realised its duty in regard to supervision of food supplies by sanctioning the appointment of two Food Inspectors, and by raising the question of providing an Analytical Laboratory where standards for foods would be fixed, and where routine analyses of food samples would be carried out. Further discussion under this heading is therefore unnecessary.

With regard to the education of the people, which is the next measure for consideration, the dangers of the disease and the methods of prevention are the most important features for demonstration.

Hand bills in the vernaculars should be printed and distributed broadcast. These should give in simple language information as to the cause, prevention, and cure of the disease. The method of the spreading of the germ by the sputum, the method of entrance of the germ into the body, and how the body is made weak by living in impure air, by lack of sunlight, by impure water, by careless habits (by uncleanliness, so that the germs have a chance to develop, &c.) could all be expressed in simple fashion. Work of this nature, however, to be of permanent value must be persisted in, and it is maintained that the people would be more quickly and cheaply educated in this than in any other manner. In addition, lectures by the Medical Officer of the Tuberculosis Dispensary and by the Nurse's visits and instructions given by voluntary works of the Social Service Leagues would all be valuable aids in spreading this information. The Schools built by the Corporation should be models in every respect, and every school would be a prophylactic agent against the disease if lessons in hygiene from pictures or printed maps and cards were made a part of the curriculum even in the most elementary of these institutions. The climate of Madras is in every way suitable for open air Schools, and there seems to be no reason why the teacher's should not take part in this campaign. In Britain medical inspection of school children is already a part of the campaign, but it need only be mentioned here as it is probable that the Dispensary Medical Officer would have enough to occupy his attention in other ways.

The mere isolation of a few advanced cases, or the treatment of a number of early cases in a sanatorium are steps of little value where a large community is concerned. Even where the Public Health Authorities visit and advise notified cases at regular intervals under a system of voluntary notification, give facilities for the disinfection of house, bedding, etc.,

and as in some English towns, supply sputum flasks, it has been found that the Medical Officer of Health and his staff are unable to cope with the additional work undertaken in dealing with pulmonary tuberculosis while it is doubtful if the maximum value is got from these measures so long as they are dealt with as part of the routine work of the Health Department.

The Tuberculosis Dispensary is the head quarters for the organisation of all these measures, and all administrative work in connection with this disease should be performed by the Medical Officer in charge of the Dispensary, who can give his whole attention to the scheme as a separate unit, which it deserves and requires.

In England the regulations under the Infectious Diseases (Notification) Act 1889 expressly provide that no authority is authorised or required to put into force any enactment which subjects the patient to any restrictive prohibition or disability affecting himself or his employment, occupation or means of livelihood, on the ground of his suffering from pulmonary tuberculosis. But in Scotland, the Local Government Board while urging the inclusion of pulmonary tuberculosis (phthisis) reserve the right to refuse consent if local authorities cannot show that they are prepared to deal adequately with such notified cases.

Were these regulations to be adopted in Madras, patients suffering from pulmonary tuberculosis could be protected from any undue hardship by a similar proviso to that adopted by the Local Government Board for Scotland. Under the present circumstances it would seem necessary to make this proviso, as it will be some considerable time before patients can be accommodated in a Tuberculosis Hospital or in a Sanatorium. In any case, it is submitted that the time has come to initiate a campaign against pulmonary tuberculosis, and this campaign would probably be more certain of success if an anti-tuberculosis League, somewhat on the lines of that formed in the city of Bombay, were inaugurated by some of the leading influential citizens.

Notification of Infectious Diseases.

Information to the Medical Officer of Health, Madras Corporation.

Diseases to be notified are Small-pox, Plague, Cholera, Typhoid, Enteric Fever Diphtheria, Pulmonary Tuberculosis, Etc.

Madras, dated,

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Name of street.	No of house.	Name of patient.	Sex.	Age.	Disease.	Remarks.

Medical Practitioner

N.B.—The attention of the Medical Practitioners is invited to Section 363 (1) of the Madras City Municipal Act, 1904, quoted below :—

Section 363 (1).

If any medical Practitioner becomes cognisant of the existence of any dangerous disease in any private or public dwelling (not being a public hospital) in the City, he shall give information of the same to the President, or the Health Officer or the Sanitary Inspector of the division, with the least practicable delay.

Attention has been drawn in connection with the memorandum regarding compulsory notification of Tuberculosis, to Section 366 of the Municipal Act, by which the Officer has power by an order “to cause such person (*i.e.*, suffering from a dangerous disease) to be removed to the said hospital or place.” It has been suggested that under this Section, the Health Officer will be bound to take some sort of action, while the Government Memorandum on the subject distinctly lays it down that no interference with the liberty of the individual citizen is to be made in so far as Pulmonary Tuberculosis is concerned. It is a fair assumption that, in the face of this Government Memorandum and the report, the Health Officer would not use this power in cases of Pulmonary Tuberculosis but it would be as well in order to allay any fears and to avoid any objection to notification, made on this plea, to have the act amended. Some such phrase as “except in cases of Pulmonary Tuberculosis” might be inserted between the words “cause” and “such” in line 11 of section 366. This, or some such similar phrase would meet the objection which is going to be raised when the memorandum comes up for discussion.

APPENDIX C.

Proposals regarding the provision of Corporation Mid-wives.

The Vital Statistics for the year 1913 show that the rate of infantile mortality—and by that is meant the rate of mortality in children under 1 year of age—is appallingly high. Much of this loss of life is preventable and in a previous memorandum, one of the methods of prevention *viz.*, the improvement of the milk supply has been suggested and accepted by the Corporation. This alone will not completely solve the problem and the Corporation should now consider the question of placing the services of trained mid-wives at the disposal of any poor woman who requires them. This is already being done in many towns in England and Scotland and Bombay, so there need be no hesitation in attempting to introduce a scheme here which is already working well in other cities. It is true that there are, in the city, four large institutions where labour cases are treated, *viz.*, the Government Maternity Hospital, the Rajah Sir Ramaswami Mudaliar Lying-in-Hospital, the Victoria Caste and Gosha Hospital and the Christina Rainy Mission Hospital, Royapuram, but while these hospitals, no doubt deal with large numbers of cases and while there are also trained mid-wives and nurses practising in the city, it will be readily admitted that much more might be done.

An outline of the Bombay scheme might be of interest. Since 1902, ten qualified visiting Nurses and Midwives have been attached to ten of the free Municipal Dispensaries in the different parts of the city. Their duty is to find out and advise prospective mothers as well as attend confinements in poor families; repeating their visits during and after the lying-in-period; and to find out, as far as possible, and to warn against, the pre-natal and post-natal influences adverse to infant life. It is admitted that these ten midwives are an inadequate number for the requirements of the vast population of Bombay. Moreover, the class of people dealt with, from poverty, ignorance or superstition, cannot be reached by simply providing trained nurses, unless they are taught to appreciate them and enabled to employ them. With the co-operation and assistance of the Health Department, the Bombay Sanitary Association has now started a movement with the object of putting the native midwife under trained supervision. The native dais of the city have been collected in the different Municipal Dispensaries with the aid of the District Registrars and Municipal midwives and instructions given them in their own vernacular in the elementary principles of midwifery; also a course of lectures and demonstrations. The object is to get to know these women and their methods and induce them to call in skilled aid and ask for the help of a municipal trained nurse free of charge and to notify all births and deaths to the Health Department and all cases of sickness among women. The association will give prizes to those who, having attended these lectures and demonstrations, show that they have adopted cleaner and more rational methods and called in the trained nurses. A Ladies' Committee with sub-committees for the various divisions of the city is being formed, and they will undertake to collect funds and supervise the work of the Lady Health Visitors and the Dais. The scheme has not yet been worked out in full detail but these are the general lines on which it is intended to proceed.

The Government Maternity Hospital in Madras trains numbers of midwives for mofussil Municipalities, the local Corporations paying for their training which extends to a period of one year. After passing an examination, a certificate or diploma is awarded and the midwives return to their native town to take up practise among the women of the poorer classes. Nothing of the kind has ever been done in Madras City and the time is now ripe for such a scheme. The Superintendent of the Maternity Hospital is in favour of it, if the Corporation finds the money to pay for the training of the women, and other medical authorities in the city have expressed their belief in the necessity for some such scheme.

The Superintendent of the Maternity Hospital might be asked to admit twenty of these potential midwives. At the end of their year's training these women would be posted to various dispensaries &c., throughout the city, or might perhaps be placed under the supervision of the Medical Registrars for the various divisions. They would be expected to visit pracheries, villages &c., within the city boundaries and find out pregnant women, give them advice, and, if possible, persuade them to avail themselves of their services. They would be able, in addition, to give valuable aid to the Medical Registrars and indirectly to the Vital Statistics Branch of the Health Department by reporting all births they came across in their districts, for it has been found that probably the birth rate is considerably higher than has been estimated owing to a fairly large percentage of births never having been registered at all.

The Medical Registrars, no doubt, already are acquainted with the barber women in their districts and if their work could be supervised and improved by the Municipal midwives or by the Voluntary Health Visitors, then the first step in this direction would have been successfully taken. In this connection again, Voluntary Workers' Associations are of the greatest help and the Social Service League, it is believed, has been already doing work in this direction in various parts of Madras. Their cordial co-operation with the Madras Corporation would ensure the success of some such scheme as outlined above.

Visitors should have their notice drawn to the following points :—

The first object of the visitor should be to get into friendly relationship with the mother and family. Unless she can accomplish this, her visits otherwise are not likely to be of advantage to the child. It should be held as an inviolate rule that where a mother can nurse her child she should be encouraged to do so. As a rule where breast milk fails the best substitute is cow's milk. Fortnightly visits are desirable especially during the early months. A record of each visit should be returned to the Secretary of the Voluntary Workers' Association who would consolidate these for the information of the Health Department. The visits can in no case take the place of medical advice. Its object is rather to give such general directions in the management of children as seems needful. Children, especially young children are probably most susceptible to the injurious effect of what are known as insanitary conditions *i.e.*, poorly lit rooms, dirty floors, dirty bed, clothing and dirty bodies. The keeping of food and particularly of milk protected from dust in a vessel with a clean and suitable cover is of the utmost importance for the health of the whole house-hold.

Visitors are urged to impress upon all mothers the desirability of taking their babies at regular intervals to the local dispensaries for inspection.

The following hints about the management of children should be issued in leaf let form and printed in the vernaculars, for distribution by the Health Visitors, Sanitary Inspectors, Dispensaries, by Corporation Midwives and Medical Registrars.

CORPORATION OF MADRAS

Hints about the management of children

To MOTHERS.

The living connection between the body of the mother and the body of the child, which exists before its birth and makes both suffer from injurious influences, continues throughout the period of suckling.

Before and after the birth of a child the mother should, therefore, preserve as much peace of mind and body as possible. She should have plain, nutritious diet. Above all thing, she should avoid toddy or alcohol in any form. For a mother to drink toddy is almost as bad as to give it to the child directly, which would be to poison it.

FEEDING BABY.

Breast Feeding:—A mother's first duty is to suckle her child, and her second is to do it in the best possible way. The best food for an infant is its mother's milk. A newly-born baby should be put to the breast as soon as it is washed and dressed, and the mother has rested. The milk first supplied by the mother acts as a laxative, so that castor oil is unnecessary.

Regular Habits should be cultivated from the earliest age.

Do not put the baby to the breast every time it cries.—Such crying is frequently due to indigestion or colic, and is relieved by anything hot. Breast milk will relieve if for a few moments only and then the child will be worse than ever. If it cries during the night, or in the intervals between feeds a teaspoonful or two of hot water may be given. Breast milk must be given only at regular intervals, and if the child is asleep at feeding time it should be wakened. Let baby drink slowly; quick drinking causes vomiting. It is dangerous to put the baby to the breast and then fall a sleep. The child may be smothered, or indigestion and colic produced. If the mother has not enough breast milk, it must be supplemented with cow's milk, diluted with warm water and cream, with sugar added. Never assume that the mother's milk does not agree with the child and do not put the child on any form of patent food without medical advice. Bread, cornflour and such starchy foods are bad for young infants. Until the teeth begin to appear, milk only should be given.

Number of Feeds.—As a rule the interval between feeds during the night should be twice as long as that which separates those during the day. For the first month it is well to feed every two hours, for the second every two and a half hours, and thereafter every three hours daily, with intervals every four, five and six hours at night.

Weaning Baby.—Long continued sucking is bad for both mother and child. The child should be weaned gradually, and as a rule should not have the breast milk after the ninth month. Thick kanjee or bread and milk, and ultimately well-boiled rice with sweet milk, should be added to the diet after the teeth appear. The habit of giving children, especially infants, share of their parent's food is a bad one. When mothers are consumptive this may form a ready means of carrying infection.

Artificial feeding—If the breast milk is insufficient the child must be fed wholly or partly with cows' milk which properly prepared may supply the best substitute. The following mixtures have been found satisfactory. If cream cannot be obtained, some form of oil (such as ten drops of olive or cod liver oil) may be substituted.

Give one feed every two hours in the day and twice at night

	1st week.	2nd week.	3rd week.	4th week.
Boiled milk	2 teaspoonfuls	3 teaspoonfuls	4th teaspoonful	5 teaspoonfuls
Boiled water	5	do	6	do
Cream	1	do	1	do
Sugar	½	do	½	do
Lime water	1	do	1	do

During the second month.—Give one feed every $2\frac{1}{2}$ hours or eight feeds in every 24 hours.

Milk	...	2 tablespoonfuls.
Water	...	2
Cream	...	1 teaspoonful.
Sugar	...	1
Lime water	...	3

From the second to ninth month.—Give seven feeds in the 24 hours, at three hourly intervals.

From 2nd to 6th Month.		From 6th to 9th Month.	
Milk	... 3 to 4 tablespoonfuls.	Milk	... 5 to 6 tablespoonfuls.
Water	... 3 to 4 "	Water	... 5 to 6
Cream	... 1 to 8 teaspoonfuls.	Cream	... 1 to 4 teaspoonfuls.
Sugar	... 1 lump.	Sugar	... 1 lump.

The bottle should be boat-shaped, and provided with a rubber teat, which can be turned inside out. An India rubber should never be used. After each feed both bottle and teat should be rinsed first with cold water, then scalded, and allowed to stand in cold water till again required. Fresh milk should be bought morning and evening, boiled on receipt, put into a clean (scalded) chafie covered with a clean cloth, then cooled and kept in a cool place.

At each feed the exact quantity of milk and cream required should be poured into the feeding bottle, then diluted with boiling water, sweetened with sugar and given to the infant at blood heat. Any left over should never be reheated for a second feed.

To make Barley Water—Put one teaspoonful of pearl barley into one pint cold water, boil for twenty minutes and strain through muslin. Make a fresh supply daily.

GENERAL HINTS.

Eyes.—At birth cleanse the eyelids and thereabouts carefully with clean warm water. *If the eyes look red, or run with matter a few days after birth*, take the baby to the nearest Dispensary and get the doctor to look at them at once. The eyes may be destroyed if not treated immediately. The discharge is infectious.

Washing Baby.—*Give a baby a bath night and morning*, using warm water and soap. This, with care in changing cloths, will promote general health and prevent scalding.

Dressing Baby.—The clothing should be warm and fit easy. Heat is life to an infant. Keep the legs and arms as well as the body warm, but not so warm as to cause sweating. Do not hamper the movements of the limbs, chest, or belly by heavy or tight clothing.

Exercise.—Is essential for the infant. Let it use its arms and legs freely, encourage to hold up its head, to attempt to sit up, stand and crawl.

Sleep.—comes naturally to a healthy child. Wakefulness means illness. Don't accustom baby to be rocked or nursed to sleep or to sleep in your arms. Fresh air makes sleep more refreshing. Never use Comforters (Dummy Teats), Soothing Syrups, Sleeping Draughts, Laudanum, or any other medicine. They are poisonous.

Fresh Air.—All children should have plenty of fresh pure air. Do not take them out at night, or in wet, cold weather.

Crying, sleeping, waking, and relief of the bowels are matters of habit ; be careful therefore, to induce good and regular habits during the first few weeks of life, when habits are most easily formed.

If the child's mouth should get sore and white spots appear on it, see that the teat and bottle, or, if the child is on the breast the nipples are kept clean ; wash out the mouth with a soft rag and warm water after each feed. If it passes undigested curds by the bowel, the milk is too strong and should be further diluted. If it has diarrhoea, a teaspoonful of castor oil should be given to clear out any irritating matter from the bowels. The milk should be boiled, a smaller quantity should be given, and the bottle scalded with boiling water. If diarrhoea continues, medical advice should be got. Cornflour, Arrowroot, and such starchy articles are bad for young infants.

Constipation in infants may be cured by :—

- (1) One teaspoonful of orange juice or grape juice in some sweetened water, or
- (2) One teaspoonful of olive oil, or
- (3) Frequent sips of water.

The city of Madras was the first to utilise the services of European District Nurses in connection with anti-malarial work. Several of these women are diplomaed midwives, and were some such scheme of providing midwives introduced, and gradually extended, by and bye these European Nurses could probably spend at least a part of their time in supervising the work of the native midwives, or of giving lectures and demonstrations to the barber women in their district.

Details could be worked out gradually but it is maintained that if infantile mortality is to be reduced, then the services of these midwives are essential. It is hoped the Corporation will approve of these suggestions and give them due consideration. If the Commissioners would take up the question, and find out in their respective divisions the feeling with regard to the necessity for these midwives, some progress would have been made, and they would considerably aid the Health Department in making concrete proposals in detail.

Statement showing the places inspected and the number of inspections made by the Food Inspector, North Range, during the year 1913.

Serial No.	Description of the places inspected.	No. of Inspections made during the year.	Remarks.
1	Markets	235	
2	Bake-houses	334	
3	Aerated Water Factories	98	
4	Coffee-hotels	218	
5	Sweet-meat bazaars	388	
6	Spring Haven Shed	186	
7	Royapuram Goods Shed	108	
8	S. I. R. Beach Goods Shed	57	
9	Egmore Goods Shed	13	Inspected by F. I. of South Range from 1-8-13.
10	Salt Cottars	83	Do. do.
11	Grain bazaars in Wall Tax Road	44	
12	Grain bazaars in Triplicane	19	Do. do.
13	Grain go-downs in North Beach Road.	48	
14	Salt fish go-downs in Wall Tax Road	56	
15	Potato go-downs	70	
16	Onion go-downs	70	
17	Fruit go-downs	70	
18	Custom House	19	
19	Shops where tinned foods are sold	30	
20	Sugar factories.	33	

Statement showing the amount of unsound foodstuffs seized and destroyed by the Food Inspector, North Range during the year 1913.

No.	Name of foodstuffs.	Quantity destroyed.	Remarks.
1	Fish	27	
2	Condensed milk	53 cases and 521 tins.	
3	Rice	69 $\frac{1}{4}$ bags.	
4	Prawns	5 baskets.	
5	Beans	7 bags.	
6	Salmons	7 cases.	
7	Horlick's malted milk	1 case.	
8	Aerated waters	112 bottles.	
9	Biscuits	3 cases and 36 rolls.	
10	Flour	33 bags.	
11	Confectionery	2 cases.	
12	Soji	2 bags.	
13	Peas	10 bags.	
14	Fruits	757 big baskets and 256 small baskets.	
	"	10 cart loads.	
15	Onions	210 bags and 9 cart loads.	
16	Cheese	21 cases and 2 tins.	
17	Barley	1 case.	
18	Bengal grams	11 bags.	
19	Grains and black grams	2 $\frac{1}{2}$ bags.	
20	Lunch tongue	3 tins.	
21	Table Jelly powder	25 packets.	
22	Garlics	231 bags.	
23	Allenbury milk food	24 tins.	
24	Cocoa	16 tins.	
25	Bharataria shirup	12 tins.	

Statement showing the places inspected and the number of inspections made by the Food Inspector, South Range, during the calendar year 1913.

No.	Description of Inspection.	No. of Inspection.	Remarks.
1	Railway Import Sheds	121	
2	Markets	397	
3	Bazaars and shops	292	
4	Bake-houses and Sweetmeat Bazaars	146	
5	Restaurants, Coffee Hotels and Eating Houses	294	
6	Dairies and Milkshops	46	
7	Aerated Water Factories	49	
8	Ice Factories	3	

Statement showing the amount of unsound foodstuffs seized and destroyed by the Food Inspector, South Range, during the calendar year 1913.

No.	Name of foodstuffs.	Quantity destroyed.	Remarks.
1	Aerated waters	78 bottles.	
2	Austrian flour	45 packets.	
3	Jaggery	2 bags.	
4	White sugar	2 kerosine tins.	
5	Grease	1 viss.	
6	Confectionery	1 do.	
7	Biscuits	1 tin, 2 lbs.	
8	Mixed grains	1 bucketful.	
9	Honey	1 bottle.	
10	Butter	2 tins $\frac{1}{2}$ lb.	
11	Onions	3 bags.	
12	Wheat flour	2 bags.	
13	Bread	5 loaves.	

Health Department, Sanitary Section.

Statement of Notices dealt with in the Several Divisions during the year 1913.

Divisions.	Total No. of Premises as per census of 1911.	No. of premises Inspected	No. of Notices pending disposal on 1-1-1913.	No. of notices issued during 1913.	Total.	No. Complied with.			No. of notices pending disposal on 1-1-14.	
						Voluntarily.	By prosecu- tion.	By transfer- to W. D.		
1	2	3	4	5	6	7	8	9	10	11
1st Div.	3296	94	16	296	312	132	39	...	108	33
2nd „	6223	819	91	1059	1150	714	390	12	...	34
3rd „	2356	295	...	571	571	250	90	6	225	...
4th „	1411	418	...	372	372	219	32	5	55	61
5th „	2001	339	...	404	404	274	14	1	24	91
6th „	2210	312	103	617	720	612	...	...	60	48
7th „	3067	275	36	378	414	277	11	...	...	126
8th „	2592	448	...	357	357	230	59	...	52	16
9th „	1757	189	...	210	210	103	18	1	13	75
10th „	3376	181	...	63	63	22	...	2	...	39
11th „	4336	250	99	348	447	213	164	13	...	57
12th „	2868	380	53	474	527	272	213	...	10	32
13th „	2863	136	6	373	379	115	127	13	7	117
14th „	2264	20	3	284	287	29	139	...	7	112
15th „	1705	137	...	240	240	107	56	...	29	48
16th „	2396	122	35	265	300	121	86	...	40	53
17th „	4221	186	76	310	386	235	24	4	41	82
18th „	3604	275	181	450	631	330	1	67	66	167
19th „	4382	210	141	418	559	85	200	45	1	228
20th „	2667	42	10	165	175	49	50	...	2	74
Total ...	59595	5128	850	7654	85044	389	171	3169	740	1493

CORPORATION OF MADRAS.
HEALTH DEPARTMENT. (SANITARY SECTION).
Statement of notices issued and disposed of during the year 1913.
(a) Total Number of premises in the Divisions according to the census of 1911.....59595.
(b) No. of premises inspected during the year 1913.....5128.

Section or Bye-law	Substance of Section or Bye-law.	No. issued during the Year 1913.		No. complied with		No. disposed of by transfer to W. D. for departmental execution and recovery of cost.		No. pending on 1st Jan. 1913.	No. withdrawn or disposed of, etc.	No. cancelled or etc.	No. pending on 1-1-14.
		No. pending on 1st Jan. 1913.	Total.	Voluntarily.	By prosecution.	8	7				
1	2	3	4	5	6	7	8				
218	Constructing and connecting a house drain with a public drain	...	2	62	64	24	...	8	...	32	19
221	Maintenance of troughs and pipes for catching and carrying the water from the roof and other parts of a building	...	...	66	46	1	...	...	...	143	143
224	Provision of latrines by owner or occupier	...	80	435	515	198	...	40	5	...	14
227	Control of the Corporation over house drains, privies and cesspools	...	42	111	153	134	...	...	...	...	2
225	Fencing of buildings or land	...	...	2	2	...	...	...	3	1	...
245	Levelling, paving, metalling, flagging, etc., of any private street or part thereof	...	...	4	4	3	...	...	1	2	103
259	Repair of tanks, wells, etc., dangerous to neighbourhood	...	...	212	214	77	31	7	12	12	33
300	Prohibition against accumulation of filth and allowing of sewage to flow in streets	...	2	219	254	179	23	7	...	606	285
301	Cleansing of insanitary private tanks or wells used for drinking	...	35	2910	2852	1400	590	29	...	...	...
302	Do. fencing, repairing or filling up of insanitary tanks, wells, etc.	...	58	58	45	50	16	14	2	...	18
303	Do. stagnant pool, ditch, etc.	...	5	13	55	68	32	18	5	...	13
305	Do. of untenantanted buildings or lands	...	...	...	...	...	...	...	...	...	14
306	Removal of filth or noxious vegetation	...	2	2	362	364	256	93	...	1	95
307	Lime washing and cleansing of buildings	...	110	793	903	723	71	...	57	75	666
308	To set right insanitary buildings	...	437	2191	2628	1212	618	...	...	31	31
309	Rendering buildings fit for human habitation	...	32	82	114	50	33	...	...	...	...
310	Abatement of overcrowding in dwelling houses or places	...	...	1	1	1	...	...	12	...	4
315	Control over stables, cattle sheds and cow houses	...	2	28	30	14	...	...	...	...	9
316	Discontinuance of the use of a building as a stable, etc.	...	...	5	16	5	7	...	...	...	...
366	Removal of patients suffering from dangerous diseases to hospitals	...	1	18	19	17	2	...	...	...	10
367	Disinfection of buildings and articles in infected premises	...	...	1	1	...	...	9	...	...	...
Sec. 347	Bye-laws for the regulation of lodging houses	...	24	76	100	100	10	10	...	...	...
& 348, 241		...	...	10	...	...	...	...	...	...	...
Sec. 440		...	...	...	...	...	...	...	...	...	...
Total	...	850	7654	8504	4389	1713	169	1713	169	740	1493

Statement I.—Births registered during the calendar year 1913 and Vaccination of infants under one year of age.

Division.	Total births excluding still-births.	Still-births.	Deaths under one year.	Number of infants surviving.	Number of infants vaccinated under one year.	Percentage of vaccination to births registered.	Remarks.
1	2	3	4	5	6	7	8
1	518 119	1 14	140 11	378 108	155 20	29.86 15.03	
2	1,597 298	1 27	417 27	1,180 271	630 74	39.42 22.76	
3	396 58	... 8	93 11	303 47	175 26	44.19 39.39	
4	473 48	8 2	107 2	366 46	85 1	17.67 2	
5	540 80	17 4	134 2	406 78	177 5	31.77 5.95	
6	624 85	17 6	139 ...	485 85	190 4	29.64 4.89	
7	1,171 156	45 31	265 15	906 141	616 47	50.65 25.13	
8	647 111	34 4	147 12	500 99	347 11	50.95 9.56	
9	500 98	23 10	88 17	412 79	203 25	38.81 23.58	
10	916 12	19 ...	180 2	736 10	506 13	54.11 25	
11	1,475 216	22 17	310 41	1,165 175	743 45	49.63 19.31	
12	955 319	32 16	222 57	733 262	452 85	45.79 25.37	
13	434 149	8 14	94 11	340 138	236 38	53.39 28.81	
14	319 52	38 ...	43 11	276 41	167 9	43.94 17.80	
15	487 183	29 1	93 31	394 152	203 39	39.34 21.19	
16	848 236	14 20	194 38	654 198	475 81	55.10 31.64	
17	1,339 200	27 26	575 60	764 140	618 43	45.24 19.02	
18	1,251 155	26 20	530 35	721 120	484 40	37.90 22.85	
19	927 110	26 6	162 9	765 101	410 46	43.02 39.35	
20	646 87	11 5	124 8	522 79	274 30	41.70 32.60	
Total.	16,063 2770	398 231	4,057 400	12,006 2370	7,146 672	43.41 22.89	

N.B.—Antique figures denote Hospital births.

STATEMENT II.—Showing the number of births registered in 1912-13 and the number of infants vaccinated under one year of age.

Year.	Total number of Births excluding Still Births.	Number of children in column 2 who died before attaining the age of one year and without being vaccinated.	Number of children in column 2 who left the city before attaining the age of one year and without being vaccinated.	Number of children in column 5 who were available for vaccination (col. 2 minus 3 and 4.)	Percentage of column 6 to column 5.	Number of children in column 5 whose vaccination was postponed beyond one year of age for medical reason.	
						1	2
1910-11	16,526	4,379	3,457	8,690	84		
1911-12	15,935	4,117	3,510	8,308	92.56		
	25,24	319	1,479	726	24		
1912-1913	16,063	4,057	2,492	9,514	75.11		
	2770	400	922	1,448	672		
						46.41	25

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N.B.—The Antigue figures denote Hospital births.

This statement was prescribed in G.O. No. 1261 M., dated 10th July 1912.

Statement III :—showing the number of prosecutions instituted in the Vaccination department during the calendar year 1913.

Number of section of Act.	Nature of charge.	Number of cases instituted.	Number discharged.	Otherwise	Number convicted.	Total fine inflicted.
1	2	3	4	5	6	7
Under Section 409 of Act No. III of 1904.	(1) For not bringing children to be vaccinated after notice ...	53	17	5	31	Rs. A. P. 44 12 0
	(2) For not bringing children for verification ...	...	...	...	...	0 0 0

Statement IV :—showing the particulars of primary vaccination with different kinds of lymph during the calendar year 1913.

	Total number of operations.	Successful.	Unknown.	Percentage of success.
1	2	3	4	5
1. Calf lymph	...	...	...	...
2. Glycerine lymph	19,965	18,859	561	94.46
3. Lanoline lymph	...	...	...	...
4. Human lymph	...	...	..	...

Statement V.—Showing particulars of Vaccination during the year ending 31st December 1913.

Old Divisions.	Wards.	Corresponding present Districts.	Number of Districts in each District.	Number of Depots in each District.	Number of Vaccinators in each District.	Average number of persons Vaccinated.	Primary Vaccinations.		Re-vaccination.		Percentage of successful cases in which the results were known.										Persons successfully vaccinated per 1,000 of population.	Average annual number of persons successfully vaccinated during the previous five years.	Average annual number of deaths from small-pox during previous five years.	Average cost of each successful Vaccination.				
							Total.	Successful.	Total.	Unsuccessful.	Primary.	Unknown.	Successfull.	Total.	Unsuccessful.	Primary.	Unknown.	Successfull.	Total.	Unsuccessful.	Primary.	Unknown.	Successfull.	Total.	Unsuccessful.	Primary.	Unknown.	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
1	East Ward Centre West	1 2 3	20,318 40,635 15,120	1 1 1	410 1,347 352	1 1,106 294	470 2,453 646	880 2,453 646	1 1,085 332	264 1,080 2,93	404 2,165 625	668 1,729 484	559 291 99	73 29 2	3 3 2	632 2,023 585	26 48 19	37 75 9	9844 9555 905	27.27 32.15 59.28	33.32 51.63 59.85	1,609 1,768 905	18 15 3	0.9 0.4 0.2				
2	East Ward Centre West	4 5 6	14,564 19,179 22,473	1 1 1	339 468 370	1 1 1	652 924 774	313 456 404	1 1 1	312 356 328	623 667 403	442 500 731	500 106 105	29 1 2	560 607 688	29 29 35	21 257 15	94.27 18.71 98.85	4 4 7	38.45 33.63 30.92	1,487 554 414	102.10 28.88 18.42	4 9 6	0.3 0.5 0.3				
3	North Ward Centre South	7 8 9	37,065 28,585 20,937	1 1 1	783 475 435	1 1 1	650 463 396	1,433 938 831	700 441 395	649 451 378	1,349 892 773	970 640 533	267 228 218	2 1 3	1,239 869 754	65 10 7	84 46 55	27 15 22	40 16 22	96.49 98.52 98.17	61.37 50 66.66	34.15 30.92 37.06	1,476 1,128 661	39.82 39.46 31.57	13 15 7	0.4 0.6 0.3		
4	4th Division	10	24,979	1	1	1,560	496	2,056	596	488	1,084	957	82	1	1,040	29	974	548	189	99.52	72.58	63.57	1,394	55.80	1	0.04		
5	North Ward Centre South	11 12 13	41,523 29,776 23,717	1 — ...	1,110 819 614	1 1 1	992 587 408	2,102 1,406 1,022	856 659 502	1,722 1,406 502	1,518 997 843	130 135 778	5 1 ...	1,653 1,133 833	31 23 3	380 223 179	211 124 106	69 41 20	97.75 98.01 99.16	67.84 68.13 66.66	44.89 42.21 39.59	2,117 2,004 1,174	51.007 67.30 49.50	6 3 6	0.1 0.1 0.3			
6	North Ward Centre South	14 15 16	11,751 15,180	1 1 1	255 630	1 1 1	1,058 1,030	1,765 400	207 511	1,722 1,030	1,518 931	130 135	5 1	1,653 1,133 833	31 23 3	332 814	69 38	37 112	16 20	95.95 97.71	69.81 80.57	31.4 61.001	79.5 90.6	67.65 59.68	3 5	0.2 0.3		
7	North Ward Centre South	16 17 18	26,752 38,643 32,851	1 1 1	1,058 1,375 1,253	1 1 1	1,745 610 588	687 576 570	873 593 585	1,493 1,169 1,155	1,372 931 930	94 28 3	2,114 1,122 1,122	206 14 14	105 98 98	149 32 12	98.92 97.63 98.33	67.72 54.12 45.34	60.44 31.54 36.34	1,649 1,617 1,358	61.64 41.84 41.33	6 11 11	0.2 0.3 0.3					
8	East Ward West																											

Annual Form No. 1.—Births registered by Divisions during the year 1913.

1	2	3	4	5			6			7			8			9			10			11			
				Population according to Census of 1911.			No. of Births Registered.			Ratio of Births per 1,000 of Population.			Excess of Births over Deaths per 1,000 of Population.			Excess of Deaths over Births per 1,000 of Population.			Mean ratio of Births per 1,000 during previous five years.			Estimated Births.			
				Present Divisions.			Corresponding Old Divisions.			Males. Females. Total.			Males. Females. Total.			Males. Females. Total.			Males. Females. Total.			Males. Females. Total.			
1	East Ward	...	1	9,768	10,550	20,318	403	385	788	41.2	36.4	104.6	...	...	20.3	44.8	38.2	41.4	35	23	...	...	...	...
2	Centre ,	...	2	20,396	20,239	40,635	713	639	1,352	34.9	31.0	111.5	...	...	20.9	43.0	39.5	41.3	36	43	...	...	...	...
3	West ,	...	3	7,820	7,300	15,120	234	230	464	29.9	31.5	101.7	...	...	29.1	38.5	37.5	38.6	35	41	...	...	...	...
4	East Ward	...	4	8,557	6,007	14,564	272	260	532	31.7	43.2	36.5	104.6	...	...	5.5	34.1	44.6	38.1	39	72	...	...	...	...
5	Centre ,	...	5	10,132	9,047	19,179	302	305	607	29.8	33.7	31.6	99.0	...	...	0.1	29.7	31.6	30.6	26	63	...	...	...	...
6	West ,	...	6	12,027	10,446	22,473	393	389	782	32.6	37.2	34.7	101.0	...	...	2.1	29.5	33.2	31.2	34	26	...	...	...	...
7	North Ward	...	7	18,410	18,655	37,065	696	636	1,332	37.8	34.1	35.9	109.4	...	...	1.6	37.3	33.9	35.6	37	11	...	...	...	...
8	Centre ,	...	8	14,887	13,698	28,585	432	392	824	29.0	28.6	28.8	110.2	...	...	5.6	30.8	31.4	30.6	31	37	...	...	...	...
9	South ,	...	9	11,210	9,727	20,937	298	298	598	30.8	26.5	28.5	99.3	...	...	16.9	30.6	33.6	32.0	3	37	...	...	...	...
10	4th Division	...	10	13,137	11,842	24,979	565	533	1,098	43.0	45.0	43.9	106.0	6.2	...	...	40.4	39.8	40.1	23	67	...	...	...	...
11	North Ward	...	11	21,157	20,366	41,523	839	828	1,667	39.6	40.6	40.1	101.3	...	0.1	40.3	39.2	39.8	58	70	...	...	...	...
12	Centre ,	...	12	15,172	14,604	29,776	545	524	1,069	35.9	35.8	35.9	104.0	3.2	...	39.0	39.1	39.1	37	45	...	...	...	...
13	South ,	...	13	12,430	11,287	23,717	521	465	986	41.9	41.1	41.5	112.0	6.4	...	42.7	44.9	43.8	43	20	...	...	...	...
14	North Ward	...	14	6,216	5,535	11,751	224	212	436	38.3	37.1	37.1	105.6	5.2	...	30.5	34.4	39.8	32.3	15	29	...	...	...	...
15	South ,	...	15	7,622	7,558	15,180	314	327	641	41.1	43.2	42.2	96.0	8.0	...	37.8	36.5	37.2	37.2	15	35	...	...	...	...
16	North Ward	...	16	13,611	13,151	26,752	575	575	1,150	42.2	43.7	42.9	100.0	10.0	...	41.9	40.6	41.3	41.3	43	64	...	...	...	...
17	Centre ,	...	17	19,636	19,007	38,643	842	793	1,635	42.5	41.7	42.3	106.1	3.1	...	42.1	40.7	41.4	40.7	66	84	...	...	...	...
18	South ,	...	18	16,724	16,127	32,851	720	695	1,415	43.0	43.0	43.0	103.5	6.2	...	37.3	37.2	37.2	37.2	64	77	...	...	...	...
19	East Ward	...	19	16,998	17,360	34,358	639	601	1,240	37.5	34.6	36.0	106.3	...	0.4	33.7	32.2	32.9	23	36	...	...	...	...
20	West ,	...	20	10,565	9,689	20,254	407	447	854	46.1	38.4	42.1	91.0	37.8	37.2	37.5	104.1	104.1	104.1	45.7	26	17	...	...	...
	Total	...		2,66,465	2,52,195	5,18,660	9,934	9,536	19,470	37.2	37.2	37.2	104.1	2.3	...	38.0	37.8	37.8	37.8	642	897	...	...	...	...

* Included in the total number of Births shown in column No. 4.

Annual Form No. II.—Statement of Deaths by Divisions during the year 1913.

1	2	3	4	5	6	7	8	Deaths per 1,000 of Population from.			Mean ratio of Deaths per 1,000 during previous five years		
								Number of deaths registered.			All causes.		
Present Divisions.								Males.	Females.	Total.	Males.	Females.	Total.
Wards.													
1 East Ward	1	1.92	22,085	10,550	20,318	608	593	1,201	1,025	13.0	0.5	1.8	0.3
2 Centre "		1.36	29,879	20,239	40,635	1,157	1,044	2,201	1,108	12.8	1.0	1.2	0.2
3 West "		3.03	4,990	7,820	15,120	457	447	904	1022	11.5	0.02	5.4	5.2
4 East Ward	3	0.55	26,480	6,007	14,564	320	292	612	1096	10.6	1.3	2.5	2.0
5 Centre "		0.17	1,12,818	9,047	19,179	303	306	609	990	9.05	1.7	7.2	6.5
6 West "		0.19	1,18,279	10,446	22,473	434	395	829	1099	8.3	0.1	1.8	1.2
7 North Ward	2	0.42	88,250	18,655	37,065	706	687	1,393	1028	9.02	0.1	1.6	1.2
8 Centre "		0.24	1,19,104	13,698	28,585	479	506	985	947	9.06	0.06	1.0	0.8
9 South "		0.36	58,158	9,727	20,937	548	403	951	1360	9.01	0.9	1.3	1.1
10 4th Division	4	3.88	64,371	11,842	24,979	501	442	943	1133	0.2	0.04	3.0	2.8
11 North Ward	5	0.70	59,319	20,366	41,523	838	835	1,672	1004	0.04	0.1	3.2	2.0
12 Centre "		0.95	31,343	14,604	29,776	464	511	975	908	0.1	0.03	2.9	2.1
13 South "		1.16	20,446	11,287	23,717	396	437	833	906	0.08	0.05	3.0	2.4
14 North Ward	6	2.40	4,896	5,535	11,751	181	194	376	933	0.1	0.08	1.9	1.3
15 South "		1.76	8,625	7,558	15,180	273	246	519	1100	0.1	0.06	1.5	1.1
16 North Ward	7	0.36	74,311	13,151	26,752	451	432	883	1044	0.2	0.07	2.4	1.4
17 Centre "		1.83	21,116	19,007	38,643	762	754	1,516	1011	0.05	0.2	1.7	1.0
18 South "		0.72	45,626	16,127	32,851	597	612	1,209	975	0.03	0.3	2.0	1.3
19 East Ward	8	2.64	13,014	17,360	34,358	594	658	1,252	903	0.02	0.1	3.9	1.1
20 West "		3.90	5,193	9,689	20,254	421	391	812	1077	0.04	0.1	4.7	3.1
Total ...		27.5	1,88,604	2,66,465	2,52,195	5,18,660	10,490	10,185	20,675	1030	0.05	5.4	4.2
											0.1	1.9	10.0
											0.9	4.2	0.3
											16.5	39.3	40.3
											41.0	39.0	41.0
											40.0		

Annual Form No. III.—Deaths registered during each month of the year 1913.

Annual Form No. IV.—Deaths registered according to age by Wards during the year 1913.

1	2	3	4	5	6	7	8	9	10	11	12	Old Divisions.	Corresponding Old Divisions.	Wards.		Present Divisions.					
														Under 1 year.	1 year and under	5 years and under	10 years and under	15 years and under	20 years and under	30 years and under	40 years and under	50 years and under	60 years and under	60 years and upwards.
1	162	138	122	149	41	26	20	14	22	17	41	47	39	27	28	37	41	95	114	95	114
2	293	242	157	62	46	35	24	29	28	100	94	99	67	89	70	100	88	193	210	88	210
3	117	100	61	72	23	11	16	12	15	33	29	25	38	37	30	53	29	82	99	82	99
4	103	85	45	38	15	11	7	3	4	31	16	24	34	20	18	18	17	25	39	47	48
5	94	104	62	41	14	13	12	7	6	17	19	21	21	15	21	17	17	23	39	48	48
6	136	105	61	67	19	11	8	6	12	15	31	44	40	18	40	27	19	26	67	67	76
7	211	180	95	98	26	29	19	21	27	37	54	61	47	51	59	50	56	46	112	114	114
8	147	126	85	63	19	15	8	10	12	30	41	62	34	31	34	44	36	29	64	96	96
9	109	102	57	65	22	20	12	8	17	20	68	35	75	40	67	22	54	22	67	69	69
10	150	114	95	81	20	21	13	16	8	10	33	38	25	22	26	19	36	30	95	92	92
11	243	239	139	121	44	38	16	16	12	27	43	71	63	61	53	41	73	63	152	158	158
12	160	134	78	92	12	20	9	7	6	22	22	44	26	27	38	31	36	36	77	77	78
13	124	116	50	66	23	19	3	10	10	21	42	47	21	34	36	29	20	17	67	67	78
14	41	43	32	40	10	5	5	7	3	11	6	12	11	13	13	10	16	40	50	50	
15	64	63	39	56	12	11	3	3	3	23	5	23	14	28	10	15	11	60	61	61	
16	143	142	75	60	16	12	7	14	11	15	25	43	28	20	34	17	31	30	81	79	79
17	245	215	111	117	35	28	15	21	19	23	68	66	34	52	59	41	36	41	135	144	144
18	167	164	102	111	23	27	22	14	11	26	44	48	38	28	36	30	41	45	113	119	119
19	185	175	96	115	28	25	15	13	10	16	32	45	38	28	46	55	28	44	116	144	144
20	120	112	72	75	16	9	13	8	15	9	32	27	26	32	29	18	24	22	74	74	79
Total...	3,014	2,699	1,624	1,672	479	253	237	253	237	253	370	793	880	738	639	806	623	753	672	1,776	1,976
* Ratio per 1,000...	303.4	283.0	74.7	75.5	16.7	14.4	9.1	9.4	10.1	14.3	14.7	17.2	17.9	17.7	26.1	23.2	42.4	40.8	134.8	154.5	

* In the case of children under 1 year of age the rates was calculated on the Number of Births during the year ; in all other cases, on the Numbers living at the time of the census.

Annual Form No. V.—Deaths registered according to class by Wards during the year 1913.

1	2	3	4	5	Number of deaths registered.										Ratio of deaths per 1,000 of Population.				
					Population (according to Census of 1911).			Christians.			Hindus.			Mahomedans.			Others.		Total.
Wards.	Present Divisions.	Old Corresponding Divisions.	Wards.	Christians.	Hindus.	Mahomedans.	Others.	Total.	Christians.	Hindus.	Mahomedans.	Others.	Mahomedans.	Others.	Total.	Mahomedans.	Others.	Total.	
1 East Ward	...	1	5,271	13,976	56	20,318	247	872	82	...	1,201	46.9	62.4	80.8	...	59.1	...	54.1	
2 Centre "	...	1,151	36,276	3,196	12	40,635	73	1,956	172	...	2,201	63.4	63.9	53.8	...	54.1	...	59.8	
3 West "	...	327	12,506	2,193	98	15,120	13	787	104	...	904	39.8	62.9	47.4	...	42.0	...	31.8	
4 East Ward	...	3	540	9,199	4,771	54	14,564	8	355	249	...	612	14.8	38.6	52.2	...	36.9	...	36.9
5 Centre "	...	2,672	15,477	965	65	19,179	42	538	29	1	610	15.7	34.8	30.0	15.4	...	34.5	...	34.5
6 West "	...	2,421	15,951	4,087	14	22,473	60	608	161	...	829	24.8	38.1	39.4	...	45.4	...	40.0	
7 North Ward	...	2	1,891	33,769	1,357	48	37,065	52	1,275	66	...	1,393	27.5	37.8	48.6	...	37.7	...	37.7
8 Centre "	...	2	90	27,625	388	482	28,585	2	979	4	...	985	22.2	35.4	10.3	...	32.7	...	32.7
9 South "	...	962	19,634	276	65	20,937	82	843	26	...	951	85.2	92.9	94.2	...	45.4	...	40.0	
10 4th Division	...	4	815	18,981	5,139	44	24,979	24	731	183	...	943	29.4	38.5	36.5	...	37.8	...	37.8
11 North Ward	...	5	4,176	36,638	643	41,523	129	1,502	42	...	1,673	30.9	41.0	65.3	...	16.2	...	16.2	
12 Centre "	...	5,144	22,629	1,798	205	29,776	163	807	65	...	975	20.0	35.7	36.7	...	32.7	...	32.7	
13 South "	...	4,176	17,399	2,053	89	23,717	130	637	66	...	833	31.1	36.6	32.1	...	36.0	...	36.0	
14 North Ward	...	6	1,372	10,105	270	4	11,751	25	342	7	1	375	18.2	33.8	25.9	...	31.9	...	31.9
15 South "	...	2,141	11,589	1,384	66	15,180	52	415	52	...	519	24.3	35.8	37.6	...	34.2	...	34.2	
16 North Ward	...	7	2,356	23,023	1,324	49	26,752	58	780	45	...	883	24.6	33.9	34.0	...	33.0	...	33.0
17 Centre "	...	7	483	23,215	14,934	11	38,643	9	865	640	1	1,515	18.6	37.3	42.9	...	39.2	...	39.2
18 South "	...	572	24,738	7,490	51	32,851	16	859	334	...	1,209	27.1	34.7	44.6	...	36.7	...	36.7	
19 East Ward	...	8	2,806	26,006	5,274	272	24,358	93	938	221	...	1,252	33.2	30.0	41.9	...	36.4	...	36.4
20 West "	...	2,446	17,178	612	18	20,254	49	705	58	...	812	20.0	41.0	96.3	...	40.0	...	40.0	
Total	...		41,812	4,15,910	5,18,660	1,769	16,794	1,267	2,611	3	20,675	30.3	40.4	44.1	1.7	39.9	1.7	39.9	

Annual Form No. VI.—Deaths registered from *Cholera* by Wards during each month of the year 1913.

1	2	3	4	5	6
Present divisions.		Wards.	Ratio of deaths per 1,000 of Population.		
Corresponding old divisions.			Males.	Females.	Total.
1	2	East Ward	...	...	0.9
2	Centre	1	...	...	0.4
3	West	1	...	...	0.2
4	East Ward	...	...	...	0.1
5	Centre	3	1	2	0.2
6	West	1	1	1	0.3
7	North Ward	...	...	...	0.1
8	Centre	2	1	1	0.1
9	South	1	1	1	0.1
10	4th Division	4	...	...	0.1
11	North Ward	...	...	...	0.1
12	Centre	5	...	...	0.1
13	South	1	1	1	0.1
14	North Ward	6	2	4	0.2
15	South	1	1	1	0.1
16	North Ward	...	1	1	0.1
17	Centre	7	3	4	0.2
18	South	1	2	1	0.1
19	East Ward	8	1	1	0.1
20	West	1	1	1	0.1
	Total	...	3	2	3
			16	18	2
			34	34	34
			0.06	0.06	0.06
			0.3	0.3	0.3

Annual Form No. VIII.—Deaths registered from *Measles* by Wards during each month of the year 1913.

Annual Form No. IX.—Deaths registered from *Plague* by Wards during each month of the year 1913.

1	2	3	4	5	6
Present divisions.		Wards.		Ratio of deaths per 1,000 of population.	
Corresponding old divisions.		Wards.		Males.	Females.
				Total.	Total.
				Males.	Females.
1	2	3	4	5	6
January.	February.	March.	April.	May.	June.
July.	August.	September.	October.	November.	December.
1	2	3	4	5	6
East Ward	Centre "	West "	1	1	0-01
2	3	4	2	2	...
3	4	5	3	3	0-02
4	5	6	4	4	...
5	6	7	5	5	...
6	7	8	6	6	...
7	8	9	7	7	...
8	9	10	8	8	...
9	10	11	9	9	...
10	11	12	10	10	...
11	12	13	11	11	...
12	13	14	12	12	...
13	14	15	13	13	...
14	15	16	14	14	...
15	16	17	15	15	...
16	17	18	16	16	...
17	18	19	17	17	...
18	19	20	18	18	...
19	20	Total...	19	19	0-005
			20	20	0-005
			1	1	0-01
			3	3	0-01
			1	1	0-005

Annual Form No. X.—Deaths registered from *Malaria* by Wards during each month of the year 1913.

1	2	Wards.	Corresponding old Divisions.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.			Ratio of deaths per 1,000 of Population.			Mean ratio per 1,000 during previous five years.			
															Males.	Females.	Total.							
1	East Ward	...	...	35	41	35	41	32	23	12	2	11	2	12	143	276	14.6	12.6	13.6	7.6	7.6	
2	Centre "	1	1	75	66	45	49	29	34	19	15	15	11	28	31	243	467	11.0	12.0	11.5	8.1	8.1		
3	West "	...	...	37	35	26	16	17	16	14	13	15	11	18	12	123	235	14.3	16.8	15.5	7.2	7.2
4	East Ward	...	...	22	18	4	12	12	10	14	1	3	3	3	61	53	114	7.1	8.8	8.0	8.0	
5	Centre "	3	3	11	4	6	12	7	10	13	7	8	7	9	51	62	113	5.0	6.9	5.9	5.4			
6	West "	...	...	28	17	17	15	15	16	15	17	14	11	11	93	187	9.8	8.9	8.3	8.4	8.4	
7	North Ward	...	...	38	23	21	17	26	15	10	11	22	20	21	20	126	118	244	6.8	6.3	6.5	8.5
8	Centre "	2	2	36	15	17	11	14	12	8	13	15	10	12	26	79	110	189	5.3	8.0	6.6	7.9		
9	South "	...	...	20	13	8	10	8	9	6	5	6	15	9	13	67	55	122	6.0	5.6	5.8	6.8
10	4th Division	...	...	4	18	7	6	7	4	5	6	6	6	4	4	39	36	75	2.9	3.0	3.0	4.2
11	North Ward	...	...	27	25	7	12	11	14	12	4	5	3	5	9	74	60	134	3.5	2.9	3.2	4.3
12	Centre "	5	5	9	8	3	10	5	6	7	3	11	10	5	10	41	46	87	2.7	3.1	2.9	3.7		
13	South "	...	...	4	7	8	6	6	7	6	2	7	9	7	8	38	35	73	3.0	3.1	3.0	3.0
14	North Ward	...	...	6	3	2	2	6	...	1	1	1	1	2	1	11	12	23	1.8	2.2	1.9	1.8
15	Centre "	2	1	4	2	...	4	2	...	2	1	2	2	...	4	13	10	23	1.7	1.3	1.5	2.0
16	North Ward	7	7	4	3	...	4	1	1	1	1	5	10	9	14	36	29	6.5	2.6	2.2	2.4	
17	Centre "	7	7	17	5	6	8	8	8	3	2	5	1	3	3	30	35	65	1.5	1.8	1.7	2.1		
18	South "	8	11	6	8	8	3	6	6	2	2	7	2	6	19	28	67	2.3	1.7	2.0	2.5	
19	East Ward	...	...	8	34	20	9	13	12	14	2	1	5	4	6	61	73	134	3.5	4.2	3.9	4.7
20	West "	19	15	3	8	8	13	5	1	1	1	2	9	11	53	42	95	5.0	4.3	4.7	5.5	
Total	...	...	...	450	319	264	252	225	194	146	133	175	154	222	1392	1396	2788	5.2	5.5	5.4	5.2	

Annual Form No. XI.—Deaths registered from *Enteric fever* by Wards during each month of the year 1913.

1	2	3	4	5	6	Present divisions.	Wards.	Ratio of deaths per 1,000 of Population.			Mean ratio per 1,000 during previous five years.		
								Total.			Males. Females. Total.		
1	2	3	4	5	6	Corresponding old divisions.		1	2	3	1	2	3
1	2	3	4	5	6	February.	East Ward	...	1	1	1	0.04	0.1
2	3	4	5	6	7	March.	Centre " "	...	1	1	1	0.02	0.06
3	4	5	6	7	8	April.	West " "	...	1	1	1	...	0.03
4	5	6	7	8	9	May.	East Ward	...	3	1	1	...	0.2
5	6	7	8	9	10	June.	Centre " "	...	3	1	1	0.05	0.1
6	7	8	9	10	11	July.	West " "	...	3	1	1	0.01	0.008
7	8	9	10	11	12	August.	North Ward	...	2	1	1	0.05	0.1
8	9	10	11	12	13	September.	Centre " "	...	2	1	1	0.06	0.1
9	10	11	12	13	14	October.	South " "	...	2	1	1	0.03	0.06
10	11	12	13	14	15	November.	4th Division	...	4	2	2	0.07	0.1
11	12	13	14	15	16	December.	North Ward	...	5	3	3	0.05	0.1
12	13	14	15	16	17		Centre " "	...	6	3	3	0.08	0.1
13	14	15	16	17	18		South " "	...	7	3	3	0.08	0.1
14	15	16	17	18	19		North Ward	...	6	3	3	0.04	0.09
15	16	17	18	19	20		Centre " "	...	7	3	3	0.06	0.09
16	17	18	19	20			South " "	...	8	3	3	0.08	0.02
							East Ward	...	8	1	1	0.06	0.09
							West " "	...	8	1	1	0.02	0.02
									51	20	31	0.1	0.08
							Total	...	1	6	8	6	0.1

Annual Form No. XII.—Deaths registered from *Other Fevers* by Wards during each month of the year 1913.

Annual Form No. XIII.—Deaths registered from *Dysentery and Diarrhea* by Wards during each month of the year 1913.

1	2	3	4			5			6				
			Total			Ratio of deaths per 1,000 of Population.			Ratio of deaths per 1,000 of Population.				
Wards.		Corresponding Divisions.		December.		November.		Males.		Females.		Total.	
Present divisions.		Old divisions.		September.	October.	September.	October.	September.	October.	September.	October.	September.	October.
1	East Ward												
2	Centre "		1	19	34	21	30	24	17	15	10	23	132
3	West "			70	58	50	35	28	32	26	25	133	265
4	East Ward			37	34	29	28	11	12	11	16	32	298
5	Centre "			21	12	11	7	15	11	12	11	136	523
6	West "			9	7	16	9	17	12	11	16	121	257
7	North Ward			11	11	11	11	19	12	11	16	78	155
8	Centre "			20	21	22	18	10	23	17	11	77	139
9	South "			16	15	10	12	13	13	11	16	74	159
10	4th Division			11	9	11	17	13	13	16	21	14	126
11	North Ward			35	41	24	28	29	29	18	11	19	105
12	Centre "			4	37	41	24	24	28	18	11	23	231
13	South "			5	5	55	46	47	47	54	43	41	105
14	North Ward			44	31	24	39	31	26	34	23	41	305
15	South "			21	17	17	23	21	20	19	16	13	318
16	North Ward			6	14	13	18	16	11	11	8	5	144
17	Centre "			15	26	10	14	20	13	12	12	9	112
18	South "			14	13	13	14	10	18	12	11	13	112
19	North Ward			7	37	26	27	15	15	19	23	18	173
20	Centre "			19	25	19	11	22	7	10	22	17	146
	South "			8	30	26	26	21	40	36	28	29	125
	East Ward			8	26	18	22	20	25	29	22	15	105
	West "												105
Total	...	...	552	496	469	422	401	449	422	421	303	294	615
													5,193
													2,581
													10.2
													10.0
													8.2

Mean ratio per
1,000 during previous
five years.

Annual Form No. XIV.—Deaths registered from *Tubercle of the Lung* by Wards during each month of the year 1915.

Annual Form No. XV.—Deaths registered from *Respiratory diseases excluding Tuberclse of the Lung* by Wards

during each month of the year 1913.

Wards.	Present divisions.	Corresponding Old Division.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	Ratio of deaths per 1,000 of Population.			Mean ratio per 1,000 during previous five years.	6		
																Males.	Females.	Total.				
1 East Ward	1	3	3	3	4	3	2	4	2	2	1	1	22	16	38	2.2	1.5	1.2	1.2	
2 Centre "	14	3	5	2	1	1	2	1	2	1	1	1	8	25	27	52	1.2	1.3	1.2	
3 West "	4	4	1	...	...	1	1	2	1	1	1	1	...	12	20	1.0	1.6	1.3	1.4	
4 East Ward	7	11	7	6	8	4	8	1	3	3	3	3	11	36	31	67	4.2	5.1	4.6	
5 Centre "	11	7	10	6	9	8	9	5	9	9	11	11	12	49	51	100	4.8	5.6	5.2	
6 West "	13	16	7	9	12	8	10	10	11	10	11	12	15	74	60	134	6.1	5.7	5.9	
7 North Ward	15	17	17	14	10	31	19	18	21	17	17	17	15	114	106	229	6.1	5.6	5.9	
8 Centre "	18	5	22	19	12	20	9	14	10	9	8	13	13	86	73	159	5.7	5.3	5.5	
9 South "	10	11	5	10	9	12	9	9	17	15	15	13	13	8	67	61	128	5.9	6.2	6.1
10 1st Division	4	19	18	11	13	11	15	11	10	3	9	7	6	69	64	133	5.2	5.4	5.3	
11 North Ward	17	10	6	7	5	8	11	10	14	13	12	15	15	10	70	68	138	3.3	3.3	
12 Centre "	7	9	6	5	1	1	5	10	12	5	9	12	15	14	49	53	102	3.2	3.4	
13 South "	4	4	4	1	1	4	6	5	3	3	3	3	3	14	16	35	37	72	2.8	
14 North Ward	6	3	5	2	2	1	3	4	4	5	1	10	6	5	26	20	39	5.1	4.2	
15 South "	6	5	5	8	3	7	3	5	6	6	10	8	2	26	20	39	3.4	3.2	
16 North Ward	15	10	18	15	19	22	14	14	8	9	13	13	27	101	83	184	8.0	6.2	7.7	
17 Centre "	26	21	24	16	15	20	19	24	11	13	14	16	16	109	110	219	5.5	5.7	5.6	
18 South "	13	14	12	17	17	22	17	19	16	19	18	18	19	109	108	217	6.5	6.6	6.6	
19 East Ward	5	7	4	5	2	6	8	13	10	10	8	47	39	86	2.7	2.2	1.6	1.5		
20 West "	5	5	1	6	2	5	1	5	4	1	3	3	3	23	16	39	2.1	1.9	1.9	
Total ...	217	173	175	154	174	215	170	192	193	191	212	1145	1074	2219	4.2	4.2	4.2	32	32	32	32	

Annual Form No. XVI.—Deaths registered from *Injuries* by Wards during each month of the year 1913.

Annual Form No. XVII.—Deaths registered from *Other Causes* by wards during each month of the year 1913.

Annal Form No. XVIII.—Comparing the Deaths from some of the *Principal Diseases* during the year with the Deaths during the preceding four years.

Year	Cholera.	Small-pox.	Measles.	Plague.	Malaria.	Enteric Fever.	Other Fevers.	Dysenter, and Diarrhoea.	Respiratory System.		Injury.	All other Causes.	Total Deaths.
									Deaths.	Ratio per 1,000.			
1909	21	0.04	32	0.1	97	0.1	3	0.0005	2514	4.9	41	0.08	1859
1910	153	0.3	116	0.2	134	0.2	5	0.0009	2376	4.6	42	0.08	2701
1911	747	1.4	480	0.9	170	0.3	8	0.0006	2884	5.6	52	0.1	1111
1912	374	0.7	106	0.2	95	0.2	1	0.0002	2934	5.7	42	0.08	957
Mean of the last four years.	324	0.6	192	0.3	124	0.3	3	0.0005	2677	5.1	44	0.08	1657
1913	29	0.05	34	0.06	157	0.3	3	0.005	2788	5.4	51	0.1	992

Annual Form No. XIX showing a Complete Classification of Diseases arranged in the order adopted in the Nomenclature of Diseases.

No. in the Nomenclature of Diseases.	No. in the Nomenclature of Diseases.	Causes of Death.												Total.
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	
4	Beri-beri	...	...	1	...	1	1	1	...	...	...	...	1	6
5	Cerebro-spinal Meningitis	...	...	10	3	1	...	...	...	...	...	...	...	14
6	Chicken-pox	...	...	3	4	1	7	9	7	...	2	4	1	38
7	Cholera	...	...	...	7	2	7	...	2	1	1	7	2	29
10	Diphtheria	...	...	...	2	...	...	1	...	1	...	...	...	4
11	Dysentery	...	...	...	316	295	260	221	199	180	181	172	155	145
13	Enteric Fever	...	...	...	1	6	8	6	4	7	4	3	4	2
14	Enteritis	...	...	...	235	199	208	200	266	238	245	145	141	169
15	Erysipelas	...	...	...	11	9	17	11	9	16	11	...	1	2
22	Kala-Azar	...	...	...	3	3	2	3	6	7	1	2	3	37
23	Leprosy	...	...	...	7	11	12	7	7	6	2	9	7	10
25	Malarial Fever	...	...	...	435	311	251	243	241	216	188	141	124	164
"	"	with Enlargement of Spleen	...	...	12	7	9	8	10	9	6	3	5	11
"	"	Congestion of brain	...	...	...	1	...	...	...	1	...	1	...	1
"	"	and Dysentery	...	...	3	1	4	1	2	...	2	3	...	4
25	Measles	...	...	...	21	19	37	23	21	9	4	2	4	5
28	Mumps	...	...	...	...	...	...	1	...	...	...	...	...	1
31	Plague	...	...	...	...	...	...	1	1	...	...	...	1	3
32	Pneumonia	...	...	...	56	51	48	37	31	51	39	49	51	52
33	Pyæmia	...	...	...	...	...	...	3	...	3	...	...	...	3

No. in the No. of menclature of Diseases.	Causes of Death.	Infective Diseases.—(contd.)												General Diseases.	
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.		
34	Pyrexia of uncertain Origin ...	...	26	78	115	84	67	64	66	145	62	69	63	91	930
35	Hydrophobia	...	...	...	1	...	1	...	...	...	...	...	...	2	
37	Rheumatism	...	...	...	9	4	4	6	8	5	7	6	3	4	6
39	Septicæmia	...	...	...	5	2	7	4	6	3	2	3	4	1	42
"	Puerperal	...	...	...	13	9	13	16	8	18	12	18	6	16	9
	Septic Fever	...	...	...	...	...	...	1	5	2	1	...	1	...	11
	Peritonitis	...	...	...	...	...	1	...	...	1	...	...	...	1	4
	Ankylosis	...	...	...	1	1	1	2	...	2	...	...	...	...	7
41	Small-pox	...	...	...	3	2	6	3	3	4	1	1	4	2	34
42	Syphilis	...	...	...	6	4	1	2	2	4	1	1	2	2	28
43	Tetanus	...	...	...	5	5	4	12	6	7	8	4	3	8	71
44	Tubercle excluding Tubercl. of lung	...	...	...	4	1	2	2	3	4	1	4	3	4	36
47	Whooping Cough ...	...	...	...	9	8	15	6	8	4	1	8	2	5	84
61	Anæmia	...	...	...	4	2	5	5	4	6	3	1	2	2	39
63	" Pernicious	...	...	...	5	2	2	2	...	...	1	...	1	...	13
	" and Dropsey	...	...	...	24	20	27	28	26	29	22	27	28	28	327
66	Diabetes	...	...	...	3	3	2	...	5	...	5	2	1	2	27
	Diabetic Carbuncle	...	...	...	2	1	...	4	...	5	2	8	2	4	72
"	Coma	...	...	...	1	...	...	...	1	...	...	...	...	...	2
"	Gangrene	...	...	...	3	9	1	1	3	...	1	3	1	1	22
76	Rickets	...	...	...	2	2	...	3	2	3	2	3	2	3	15

Certain morbid conditions incident to various parts.

Diseases of the Respiratory									
<i>Diseases of the Trachea and Bronchi.</i>									
404	Bronchitis (acute)	...	...	...	41	46	27	31	32
	, (chronic)	...	...	...	10	10	13	7	7
	(a) Catarhal	...	...	...	4	3	3	9	3
<i>Diseases of the Lung.</i>									
411	Hæmoptysis	...	...	...	1	...	...	1	...
413	Broncho-Pneumonia	...	...	...	73	57	61	63	51
419	Phthisis	...	...	...	61	27	29	30	36
422	Atelectasis	...	...	...	...	...	...	2	2
<i>Diseases of the Pleura.</i>									
425	Pleurisy	...	...	...	...	...	1	2	1
<i>Diseases of the Mouth.</i>									
436	Stomatitis	...	...	...	1	...	...	1	1
438	Cancrum Oris	...	...	...	3	3	...	...	1
439	Necrosis, lower Jaw	...	...	...	...	1	...	...	3
<i>Diseases of the Teeth, Alveoli and Gums.</i>									
440	Disorders of Dentition	Diarrœa	...	...	1	2	1	3	2
<i>Diseases of the Stomach.</i>									
489	Gastritis Acute	...	...	...	8	5	7	9	4
	, Chronic	...	...	...	...	5	2	1	2
499	Dyspepsia	...	...	...	14	10	12	12	5
510	Gastralgia	...	...	...	...	1	...	...	...
<i>Diseases of the Intestines.</i>									
515	Inflammation (3) Colitis	...	...	...	...	...	1	...	...
	, Gastro-Enteritis	...	...	...	23	21	23	24	21
528	Hernia	...	...	...	1	2	1	2	1
Diseases of the Digestive System.									

615	Filariasis	...	...	...	2	...	1	1	6	1	...	1	...	13
<i>Diseases of the Lymphatic Glands.</i>														
618	Elephantiasis of the leg	...	...	...	1	...	...	1	1	2	...	1	4	...
651	Nephritis Acute	...	...	...	3	1	1	2	...	3	4	2	...	19
652	Renal Dropsy	...	...	...	1	...	...	1	...	1	...	1	1	6
652	Bright's Disease	...	...	...	6	9	13	8	11	9	9	14	10	108
652	Disease of Kidney	...	...	...	2	...	...	1	1	...	1	2	...	10
674	Urinary Fistula	...	...	...	...	...	...	2	...	...	...	...	...	2
676	Cystitis	...	...	...	3	...	...	...	...	2	1	...	1	7
687	Stone in the Bladder	...	...	...	...	...	...	1	...	...	...	...	...	1
692	Suppression of Urine	...	...	...	1	...	2	...	...	1	...	...	...	6
697	Albuminuria	...	...	...	1	1	...	1	...	1	1	2	...	7
697	Uraemia	...	...	...	1	...	...	1	...	...	...	...	...	2
<i>DISEASES OF THE MALE ORGANS OF GENERATION.</i>														
712	Stricture of Urethra	...	...	...	1	2	1	...	1	3	2	...	3	18
715	Extravasation of Urine	...	...	...	2	1	1	...	...	6	...	...	...	11
741	Cellulitis Scrotum	...	...	...	1	...	2	1	...	1	...	2	...	8
742	Sloughing Scrotum	...	...	...	1	...	1	2	...	...	...	...	...	3

Diseases of the Lymphatic System.—(cont'd.)

Diseases of the Urinary System.

Diseases of the Generative System.

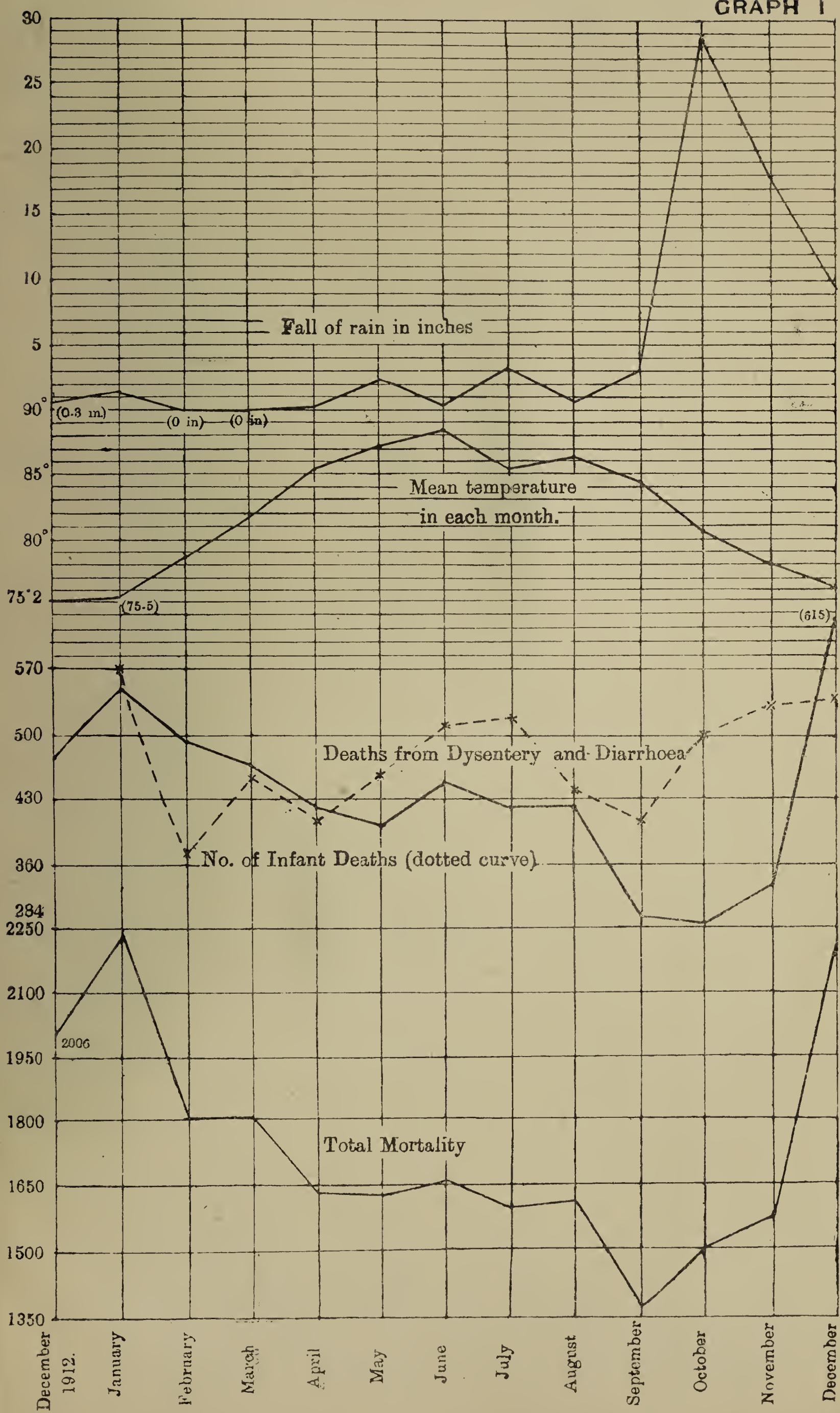
No. in the Number of Diseases.	Name of the Disease.	CAUSES OF DEATH.												TOTAL.
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	
	<i>Diseases of the Tunica Vaginalis.</i>													
754	Hydrocele	...	...	2	1	...	1	...	1	...	...	1	6	
	<i>Diseases of the Testicle.</i>													
757	Inflammation (1) Orchitis	...	...	...	1	...	...	...	...	...	...	1	2	
	DISEASES OF THE FEMALE ORGANS OF GENERATION.													
	<i>Diseases of the Uterine Ligaments etc.</i>													
783	Inflammation (b) Pelvic cellulitis	...	...	1	1	...	2	...	...	...	...	...	5	
	<i>Diseases of the uterus, including the Cervix.</i>													
797	Rupture of uterus	...	...	...	...	...	...	...	2	...	1	...	3	
	<i>Functional and symptomatic Disorders of the Female organs of Generation.</i>													
821	Menorrhagia	...	...	1	...	1	3	...	...	...	...	...	5	
	<i>Affections connected with Pregnancy.</i>													
834	Abortion	...	...	...	2	1	3	1	5	1	1	1	16	
	<i>Affections connected with Parturition.</i>													
852	Premature Birth	...	...	...	2	1	3	1	1	1	1	1	1	
	<i>Difficult Labour.</i>													
	<i>Affections consequent on parturition</i>													
853	Post-partum Haemorrhage	...	...	2	...	1	1	...	2	1	3	2	1	17
	Puerperal Causes:—													
855	" Sapræmia	...	...	6	3	4	5	7	4	6	3	7	2	55
	" Tetanus	...	...	2	1	1	2	1	1	1	1	1	1	8
870	Sudden death after delivery	...	...	...	...	...	...	...	2	...	...	...	2	2

Diseases of the Female breast.	875	Mammary Abscess	Diseases of the Mammary Gland.					
			...	...	...	...	2	...
<i>Diseases of Bones (exclusive of the Spine).</i>								
885	Inflammation (a) Osteo—Myelitis	...	...	...	...	1	...	5
„	(b) Periostitis	...	...	...	...	...	...	1
<i>Diseases of the Joints (Exclusive of the Spine)</i>								
903	Synovitis	...	...	1	...	...	1	...
<i>Diseases of the Connective Tissue</i>								
953	Abscess	6	3	6	10	8	5	86
956	Oedema	25	20	17	13	13	15	121
<i>Diseases of the Skin.</i>								
962	Eczema	...	...	...	...	1	...	2
966	Carbuncle	...	2	2	3	4	3	32
970	Herpes	...	...	...	...	...	...	1
<i>Diseases of the Skin.</i>								
962	Eczema	...	...	...	...	1	...	1
966	Carbuncle	...	2	2	3	2	2	1
970	Herpes	...	...	...	...	...	1	...
<i>General Injuries.</i>								
1025	Effects of Heat (a) Burns and Scalds	...	4	7	4	7	5	40
1030	Suffocation	...	5	4	2	1	3	56
„	by Drowning, Accidental	...	8	10	6	7	10	67
„	, Suicidal	...	4	2	1	...	7	...
1031	Starvation	...	1	...	1	...	1	5
1033	Shock	...	2	...	1	3	2	13
„	due to carriage accident	...	2	1	2	3	3	16
„	after operation	...	2	2	1	...	...	6

CAUSES OF DEATH.		LOCAL INJURIES.												TOTAL.		
No. in the No. of diseases.	mentality	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.			
<i>Injuries of Anatomical Regions.</i>																
<i>Injuries of the Skull.</i>																
1092	Fracture of the Skull	...	...	1	1	2	2	4	2	1	1	...	...	1	15
1096	Concussion of Brain	...	...	...	1	1	...	...	1	1	...	...	1	...	6
<i>Injuries of the Chest.</i>																
1156	Multiple Injury	...	...	...	...	4	1	3	6	4	5	2	...	1	27
<i>Injuries of the Back (including the whole Vertebral Column).</i>																
1162	Compound fracture	...	...	...	...	...	...	...	...	...	...	2	...	...	2
<i>Injuries of the Abdomen.</i>																
1170	Gun-shot wound	...	...	...	...	...	...	1	...	...	...	...	...	...	1
<i>Ill-defined and Non-specified Causes.</i>																
Debility	129	106	77	88	91	89	63	100	62	72	82	118
Old age	38	30	43	35	38	30	38	35	38	34	41	45
Natural Causes	1	...	2	1	1	...	2	8
Unknown	1	...	1	1	3

Graph showing
 total Mortality, deaths from Dysentery
 and Diarrhoea mean Temperature and
 Rainfall, by the month.

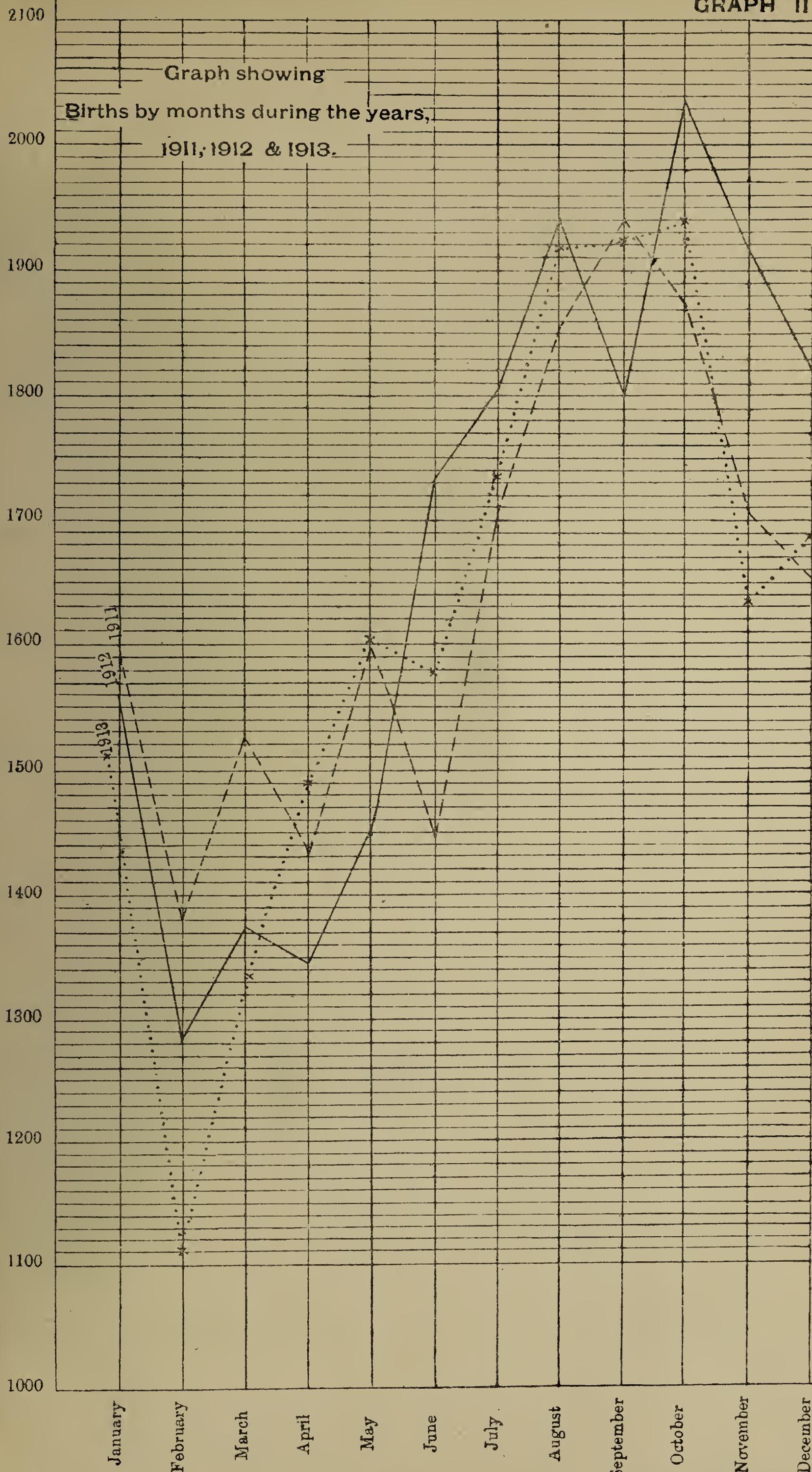
GRAPH I

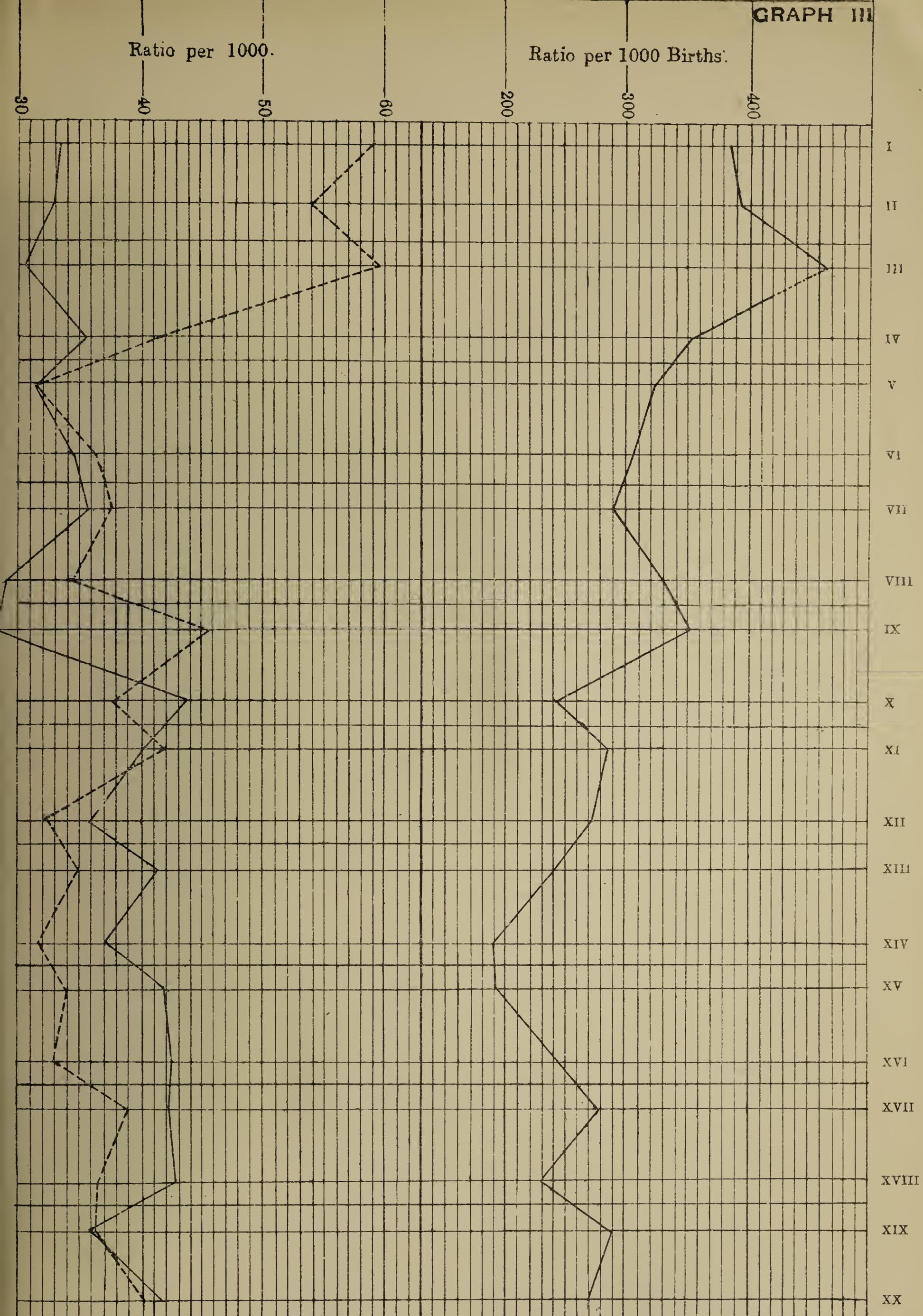


71/1000, Survey Office, Madras.
 1914.

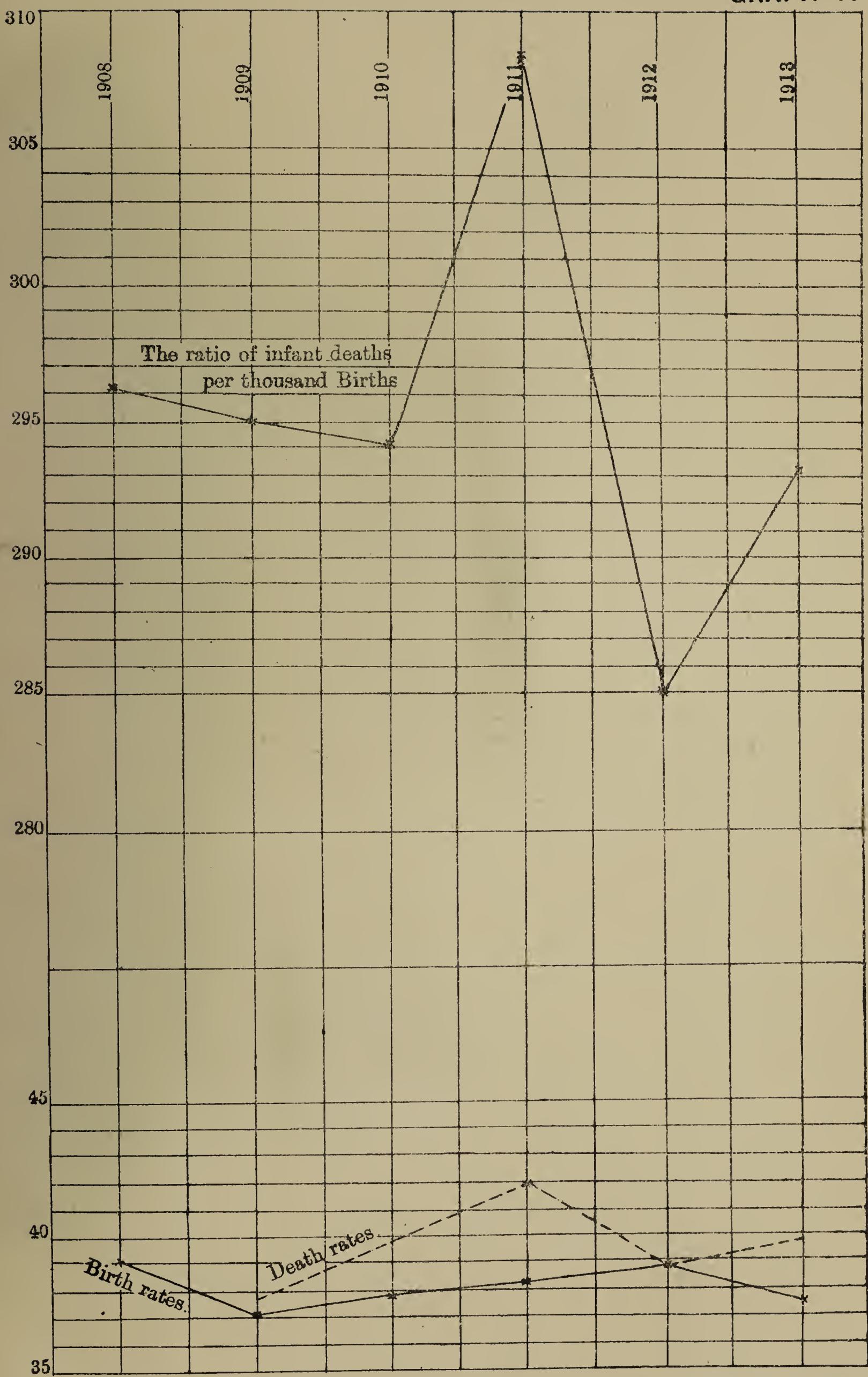
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Graph showing

Births by months during the years,
1911, 1912 & 1913.



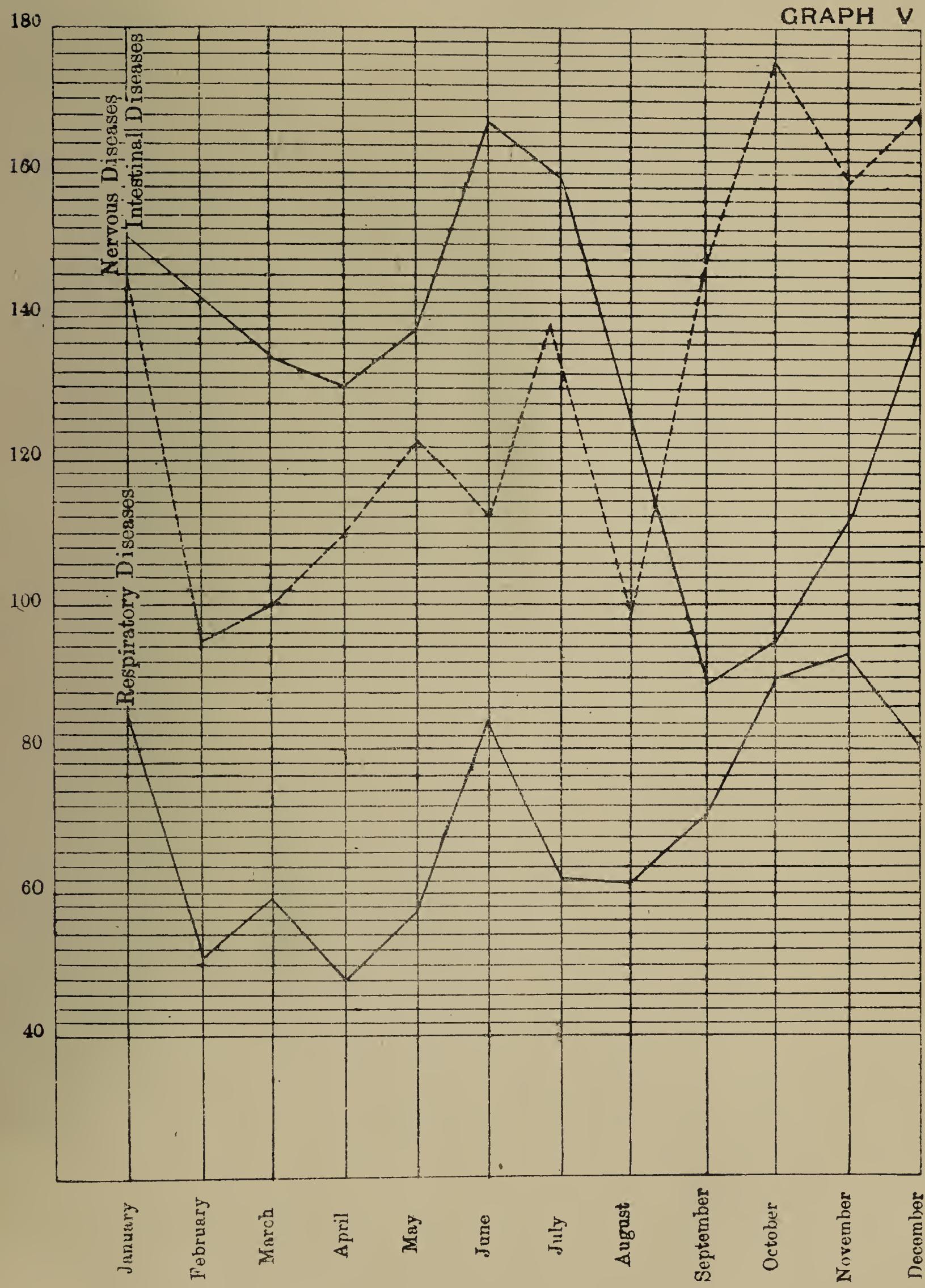
GRAPH IV



Infantile Deaths by months.

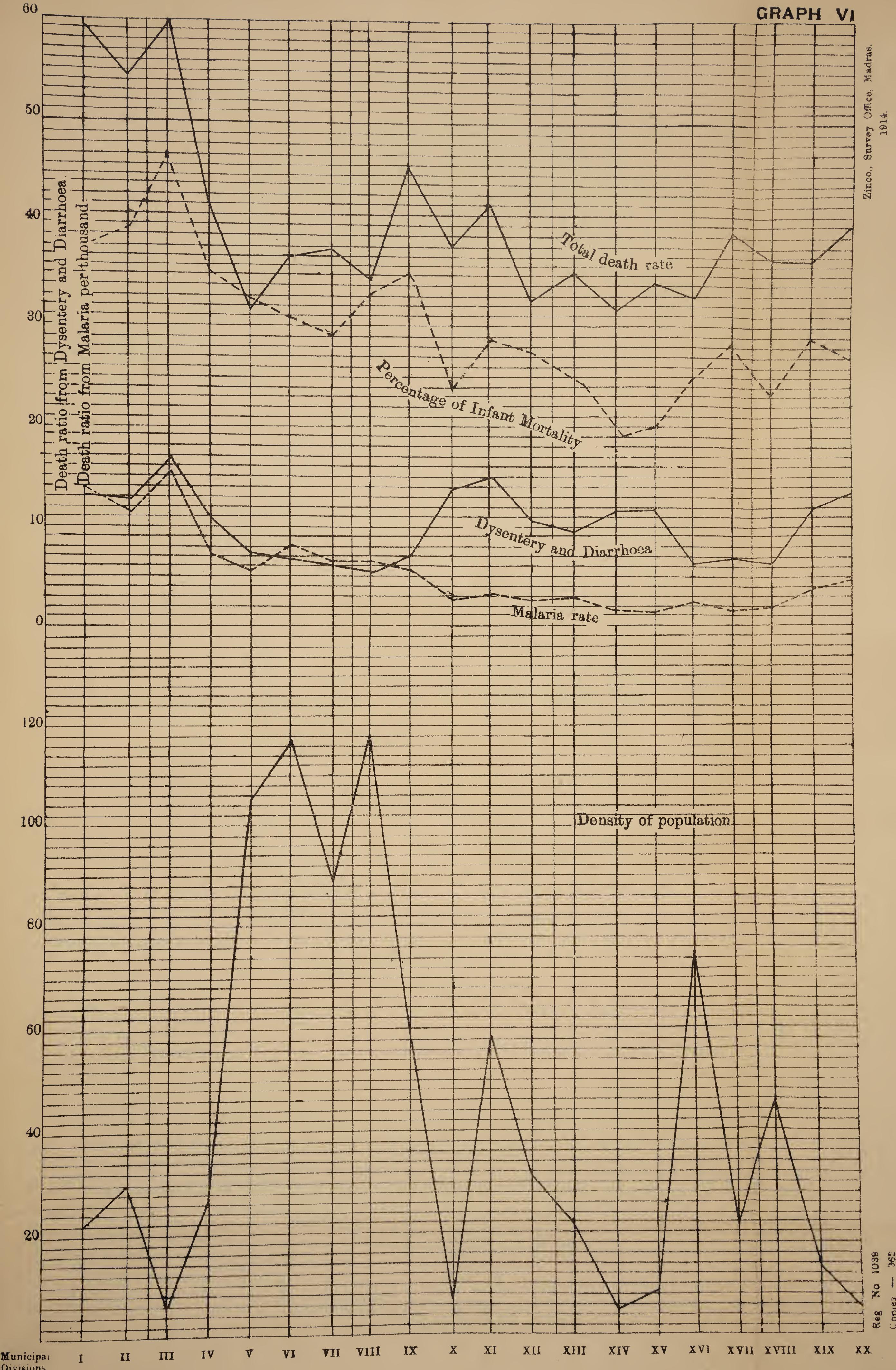
GRAPH V

Actual No. of deaths.



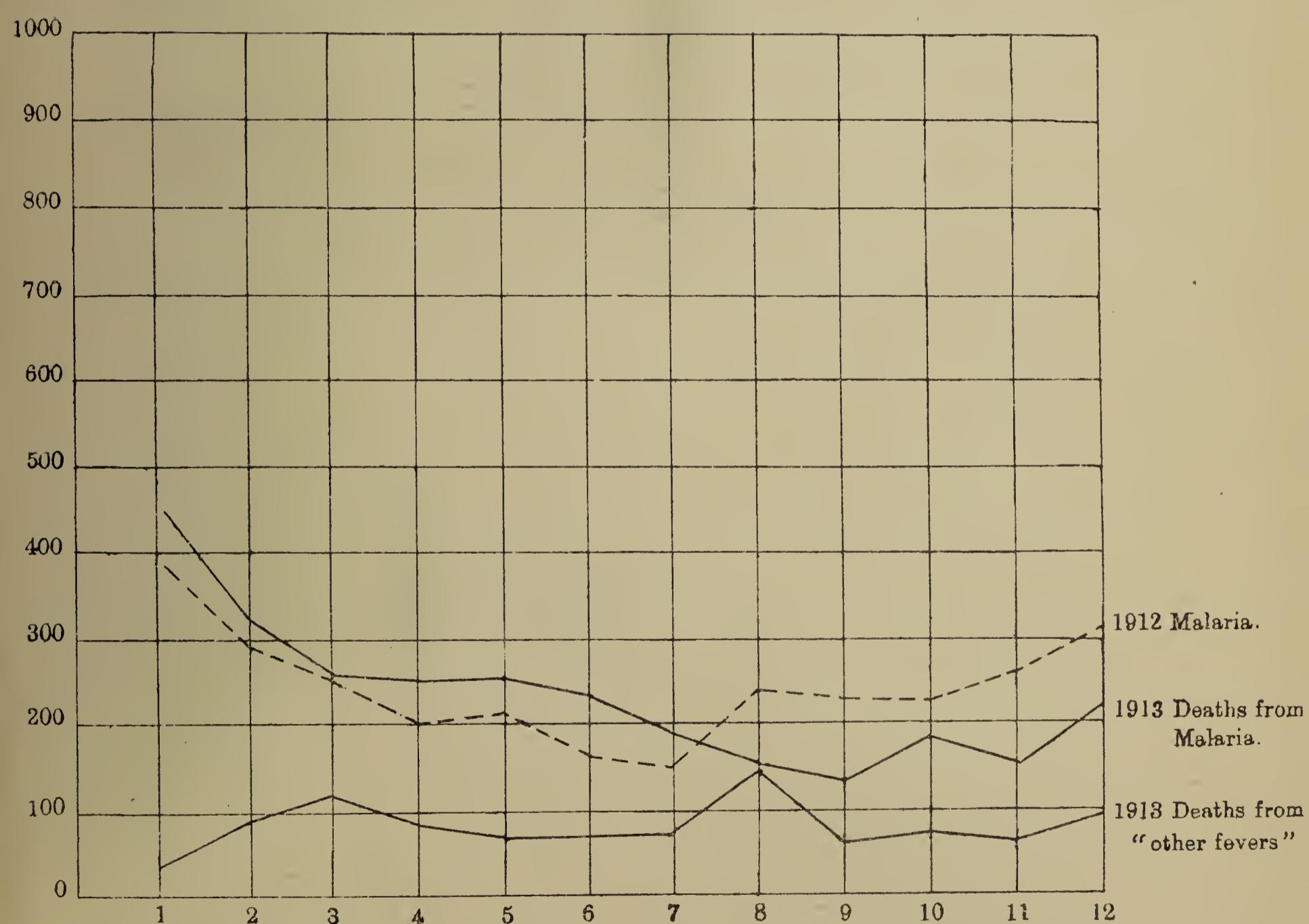
GRAPH VI

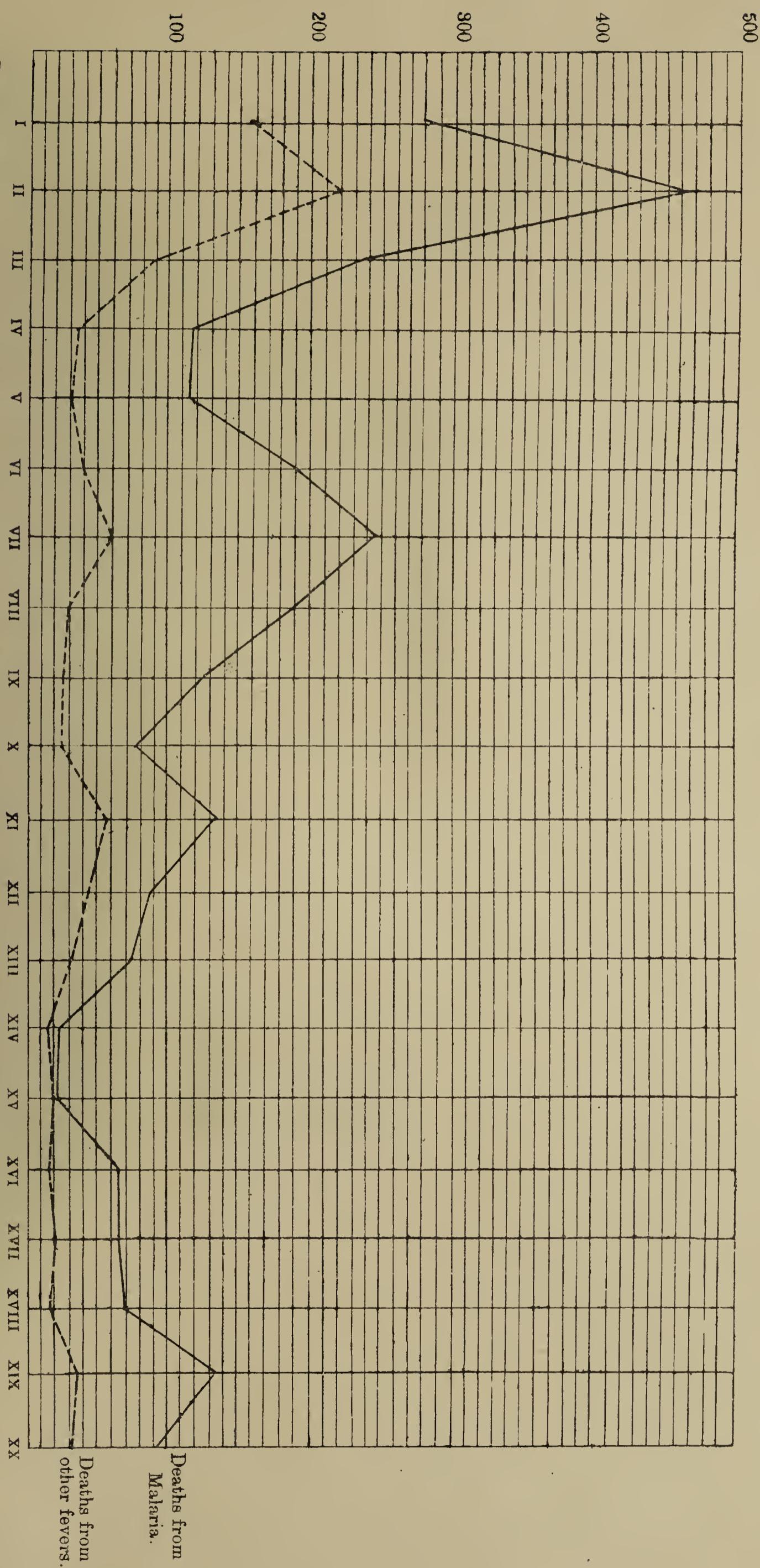
Zinc, Survey Office, Madras.
1914.



GRAPH VIII

Graph showing the Total Deaths from Malaria & other fevers
during each month of the year 1913

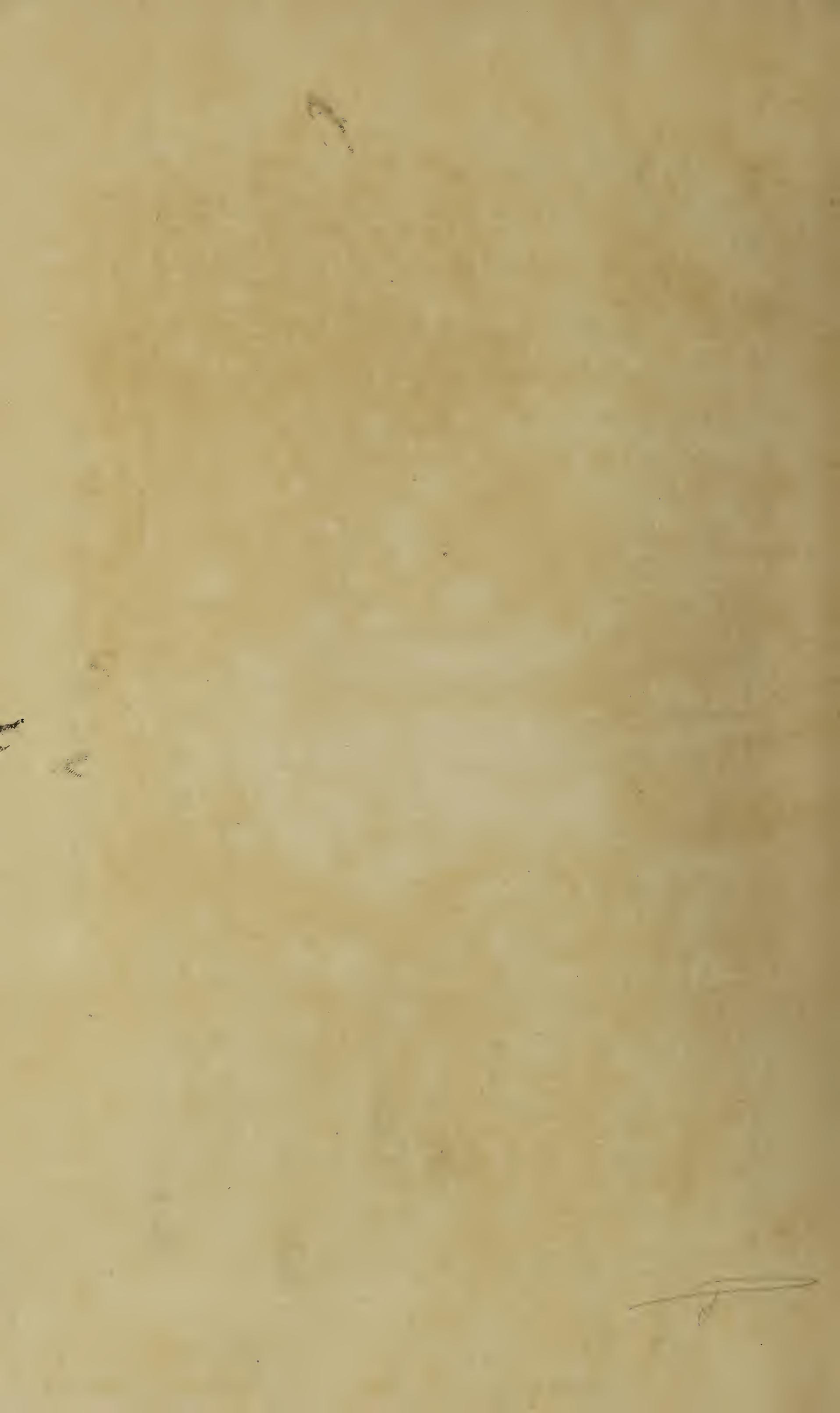


Deaths from Malaria and "other fevers" by Divisions

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Municipal Divisions.

Zinco., Survey Office, Madras.
1914.



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Annual Report.

OF THE

CORPORATION OF MADRAS

HEALTH DEPARTMENT

FOR

1913

MADRAS
THE GUARDIAN PRESS
SECOND LINE BEACH

1914